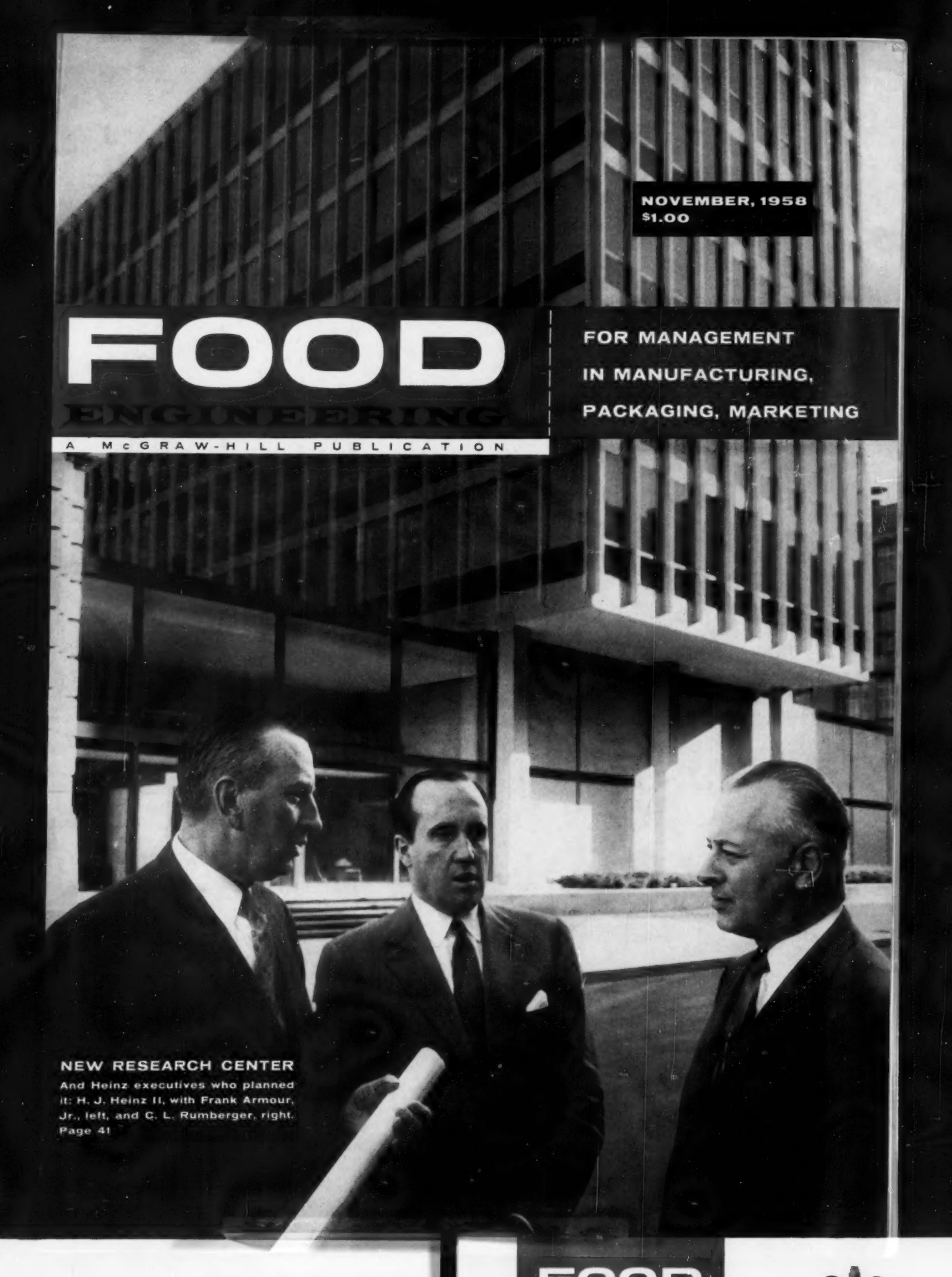
NOVEMBER, 1958
$1.00

# FOOD ENGINEERING

A McGRAW-HILL PUBLICATION

FOR MANAGEMENT
IN MANUFACTURING,
PACKAGING, MARKETING



**NEW RESEARCH CENTER**

And Heinz executives who planned it: H. J. Heinz II, with Frank Armour, Jr., left, and C. L. Rumberger, right.
Page 41

FOOD FOR THOUGHT...

# CANCO PRESSURE CANS FOR FOOD PRODUCTS

**The potential for "push-button" foods is enormous. Explore this opportunity now—with Canco!**

Few areas of product development offer as much promise as foods in convenient pressure cans. The whipped cream and topping can, pioneered by Canco, is used daily in millions of homes. Recently introduced pressurized chocolate syrup, butterscotch, marshmallow, and fudge toppings seem headed for the same success.

Yet this field is virtually untouched and the number of potential products is enormous: salad dressing, honey, syrups, meat tenderizers, cheese spreads, seasonings and sauces—to mention only a few.

Canco scientists are working diligently to meet this challenge. Drawing on the company's unsurpassed experience in food and container research, they are devising special combinations of propellants, valve and product—with exciting results!

Contact your Canco representative now to explore the possibility of packaging *your* food product in a pressure can.

**AMERICAN CAN COMPANY** CANCO



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FOOD ENGINEERING
FOR MANAGEMENT

NOVEMBER, 1958

30th YEAR

VOL. 30 NO. 11

*Trends & Forecasts* ..... 7
*Developments to Watch* .. 13
*Washington Report* ..... 21
*Comments & Questions* ... 30
*Opinion* ..... 35
*Men & Companies* ..... 123

GENERAL

**New Heinz Lab Sparks Progress** ..... 41
Its 7 research areas and pilot plant aid development and quality control work.

**Vital Tips From Court Rulings** ..... 44
Six recent cases that entangled food men spotlight tactics for foresighted operators.

***Ole Sage Episode:* How Argue the Case for Modernizing?** .. 47

MARKETING

***FE Report: New Handling Points to Lower Distribution Costs (E-1)** .. 50
Improved loading methods curb in-transit damage, cut manual handling, nip some rates.

**Beer Shipping Cost Cut 50%** ..... 55
Canadian firm moves brews by rail tank cars—and develops new market.

**Gadget-Mail Boosts Sales Drives** ..... 57
Green Giant's whimsy tickles retailers—and so gets more of them behind new promotions.

*Case History of Month* .... 59 *Marketing Signals* ..... 61

PACKAGING

***Aluminum Cans—Ready to Roll? (E-2)** ..... 66
Pro: Forming is faster, handling problems eased. Con: Cost bogey still straddles path.

*Creating the Package* .... 64 *New Packages & Products* 24

MANUFACTURING

**Boosts Man-Hour Production 50%** ..... 76
Poultry group does it by banding operations of 8 plants in 1 new highly mechanized facility.

**New Cutter Ups Corn Yield and Quality** ..... 79
Unit gages ear sizes and automatically separates younger from more mature kernels.

**Improves Concentrating 3 Ways** ..... 81
Juice to 72 Brix in one pass, nuclear method tabs density, tartrates removed in process.

**Keeps Pace by 'Spot Mechanizing'** ..... 83
Key-unit revamping lowers costs, ups production and quality—all at minimum outlay.

***Practical Ideas*** ..... 87

ENGINEERING & TECHNOLOGY

***How Top-Rung Pilot Plant Bridges Gap to New Products (E-3)** ..... 96
Astute linking of process development with market testing streamlines CP's innovations.

**Central Refrigeration Cuts Costs** ..... 99
Bakery ingeniously engineers single compressor to do work of 7 smaller units.

**Electronic 'Brains' Mastermind Multi-Item Package Flow** ..... 104
'Mechanical memory' sorting and routing win big savings in major palletizing operation.

**New Light on Beer Flavor** ..... 109
ASBC'ers get sharper focus on effects of tannins, diacetyl, -SH groups, reducing agents.

***Advances in Technology*** ..... 113

Service Center

*New Equipment & Supplies* 131
*Just Off the Press* ..... 143
*Useful New Books* ..... 147
*Recent Inventions* ..... 149
*Classified Advertising* .... 153
*Advertisers' Index* ..... 156
*Advertisers' Literature* ... 158
*Reader Service* ... Back of issue

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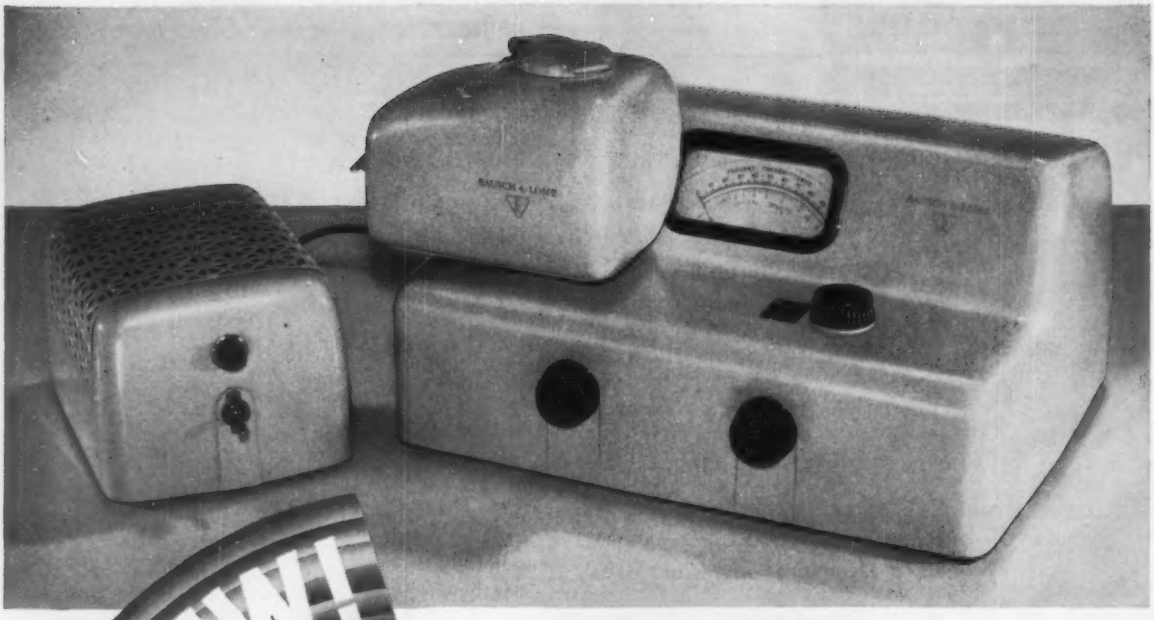
COVER—Titles of Heinz executives shown: H. J. Heinz, II, President; Frank Armour, Jr., Executive Vice-President; C. L. Rumberger, Vice-President of Research & Quality Control.



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There is no surer way to decide whether an FMC "Sterilmatic"* line is *right* for you than to ask leading food processors who are now using these continuous pressure cookers and coolers.

Ask American Home Foods, Division of American Home Products Corp., for example. They installed their first "Sterilmatic" in 1946 in their Chef-Boy-ar-Dee plant at Milton, Pa.

During the years since then, they have specified "Sterilmatic" three times – now have 7 of these lines in the plant, turning out the 53 foods they pack under the famous Chef's label.

You will learn that "Sterilmatic" pioneered a new concept in food processing – one that invariably cuts processing time, assures uniform quality, helps preserve natural color, flavor, texture and nutrients, and minimizes can damage.

The list of "Sterilmatic" users reads like a Blue Book of food processors. Let their use-experience be your guide to better, more profitable food processing.

A 16-page brochure, "The Sterilmatic Story," gives full details and is yours for the asking. Write for it – today.

*FMC "Sterilmatic" Continuous Pressure Cooker and Cooler – Trade Mark – Reg. U. S. Pat. Off.

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**Canning Machinery Division**
General Sales Offices:
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# TRENDS & FORECASTS

SPECIAL FOOD SERVICE to EXECUTIVES

**U. S. economy is recovering rapidly, McGraw-Hill Dept. of Economics** reports. New-order index for industrial machinery is up 30%, steel production is at 70% capacity, GNP rose $10 billion in 3rd quarter.

**Two leading food firms see 100% increase in need for scientists,** engineers, and technicians in next decade. Average figure is 46½% for food firms answering Scientific Apparatus Makers Assn. survey.

**Housewives pay but 61¢ on $100 for built-in maid service** in packaged foods, excluding precooked dinners, USDA survey shows. Those buying all "serviced" foods pay only 1% more than buyers of non-serviced.

**Kraft is selling single-portion packets in supermarkets.** These also are used effectly to stimulate sales of related items—as tartar sauce with fish. Condiments, dressings, and jellies are involved.

**Dehydrated potato flakes are gaining, and six manufacturers expect** to convert over 4 million bu. of fall potato crop to flakes, says USDA. Frozen concentrated mashed, and dehydrated diced, potatoes are coming.

**Fancy food sales increased 41% in year for retail stores** operating fancy food departments, according to *Progressive Grocer.*

**Hog production is gaining, and 20% increase is planned in farrowings** for the Dec.-Feb. period, USDA says. Lower prices are anticipated.

**Production of fats and oils will be up 10% in '58, to 11.7 billion lb.** Lard will gain 200 million lb.; cottonseed oil, 75 million lb.

**A can price increase by American Can was scheduled for Nov. 1.** Cost of tin plate and labor are up. Breaking with tradition, prices will be related to costs involved in each type and style of can.

**Doughnut sales increased 5% to $390,820,915 last year.** Per capita consumption was 89 doughnuts, up 68% in five years, says Donut Institute.

**Canned apricot pack for '58 is down 54% to 2,344,473 cases.** Sweet cherry pack is up slightly to 1,508,325 cases, NCA reports.

**Bigger sugar beet crop forecast for Europe may affect world sugar price.**

**Poultry used in processing is up 19% for first 7 months of '58,** compared to same period in '57. Jan.-Aug. total is 167,905,000 lb., USDA reports.

### U. S. Foods Tempt British

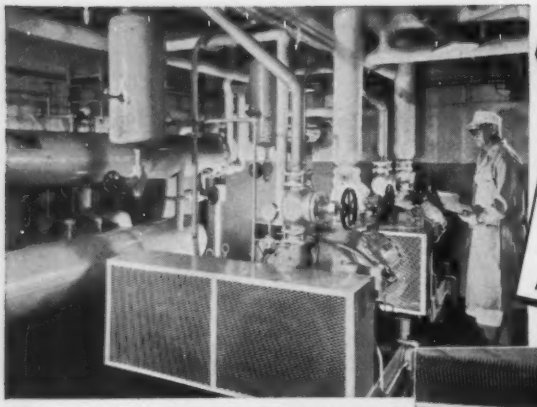
"Where can we buy your products?" That was the question most frequently asked by the thousands of British consumers and industry buyers who daily visited the U. S. exhibit at the recent British Food Fair.

Although U. S. wheat, lard, and feed grains enter the British market in large quantities, certain food imports from the dollar area are limited. As a result, U. S. fruits and rice have been available in British shops only in limited amounts, and U. S. pre-cooked frozen and canned poultry have not been available at all.

For some U. S. food products, the future now appears brighter. U. S. rice is now entering the British market, and is selling rapidly. A recent dollar allocation by the British Government is expected to move additional U. S. fruit into Britain soon.

Desire to purchase attractively displayed poultry products has been

See Developments to Watch p. 13



View of the Thiele Engine Room containing an all-Vilter system—compressors, condensers, receivers, transfer system—providing refrigeration for the entire plant.

**Vilter Report Card**

| Grade | Service |
|---|---|
| A | Proper temperatures and humidities at close tolerances. |
| A | Low operational cost. |
| A | 5 years of uninterrupted refrigeration service. |
| A | Attractive appearance. |

In the sausage cooler where Braunschweiger liverwurst, summer sausage, mortadella and many others are being readied for shipment, Mr. Fred Kreckl, chief sausage maker is critically inspecting his wares.

# "Ja, das ist gute Wurst!"

THIELE

**"Firm, smooth Thiele sausages...no shrinkages...no shrivel—are the result of quality processing of the finest in ingredients and of close temperature and humidity control by Vilter refrigeration units," says Mr. Fred Kreckl, Chief Sausage Maker, W. F. Thiele Company, Milwaukee.**

Sausage must be good, taste good, look good—have real appetite appeal to sell in today's competitive food market. Exact "cold processing" is vital in making quality sausages—during production, aging, and holding prior to shipment. And there is no better way to maintain correct temperatures and humidities than with Vilter Zer-O-Disc finned surface. These coils produce slow, even, positive air circulation naturally by convection . . . flood the room with cold . . . no "dead spots" . . . practically eliminate evaporation which cuts profit. Product discoloration and shrinkage are minimized.

Additional Vilter equipment at Thiele's includes: Ammonia VMC Multi-cylinder compressors as well as a Shell and Tube Condenser, Liquid Receiver, Liquid Transfer System and Horizontal Accumulator. A complete Vilter truck charging system is also installed. "*This equipment has met all performance specifications and operated satisfactorily for over five years with a minimum of routine maintenance,*" says Mr. Kreckl.

Call in your nearest Vilter refrigeration engineer and let him show you how you can improve your sausage and meat cooling requirements, and save with Vilter refrigeration equipment, Zer-O-Disc fin coils, and Pakicers.

**Write for your free copy of the *Special Case Study* of this application and for helpful bulletins to The Vilter Manufacturing Company, Dept. E-801, 2217 S. First Street, Milwaukee 7, Wis.**

Bulletin 817 Vilter VMC Ammonia Compressor

Bulletin 518 Vilter Zer-O-Disc Finned Cooling Coils

Vilter®

REFRIGERATION and AIR CONDITIONING

**THE VILTER MANUFACTURING COMPANY, Milwaukee 7, Wisconsin**

Air Units • Ammonia & Freon Compressors • Booster Compressors • Baudelot Coolers • Water & Brine Coolers • Blast Freezers • Evaporative & Shell & Tube Condensers • Pipe Coils • Valves & Fittings • Pakice & Polarflake Ice Machines


## Trends & Forecasts

expressed by British housewives and distributors. Pre-cooked, ready-to-heat-and-serve poultry products at the Fair were, for the most part, new to British consumers, as were packaged cake mixes containing egg solids.

There is hope that with improved economic conditions poultry products may soon be permitted entry into the United Kingdom.

Even though British purchases of U. S. lard have dropped during the past year, comments of visitors to the Fair indicate the commodity still is popular.

A demonstration of the use of lard in baking was heavily attended, and many visitors said that U. S. lard is superior in quality and plasticity to that of most other supplying countries. U. S. lard is available in Britain, but at a premium price.

## HORS D'OEUVRES

▶ Future shoppers may punch IBM cards as they walk through supermarkets, then pick up their groceries at the door. Combine this with food charge accounts handled by banks, and you have painless shopping.

▶ **"Beer and skittles" has come to mean unruffled enjoyment—sudsy brew and a tasty tidbit. But brewer promotion tells us that the expression refers to beer and an early form of bowling. Which is the higher, your beer or your skittles score?**

▶ Uncle Sam's taxpayers have a new name for farm-price support—"Agrificence."

▶ **The average American is treated to nearly 200 soft drinks a year. When a Philadelphia chemist added fruit flavor to carbonated medicine water nearly two centuries ago, he gave birth to a very effervescent business.**

▶ Heinz advises picnickers to take baby foods along for the infant. Can't it eat ants like the rest of the family?

▶ **How well was a $10,000-a-year man paid in 1939? NICB says $23,568 under today's conditions. And if he has worked his salary up to $25,000, he is making $69,991 now. Bright boy!**

▶ Confucius say: "In food game, progress no wait for him who don't keep up with same."



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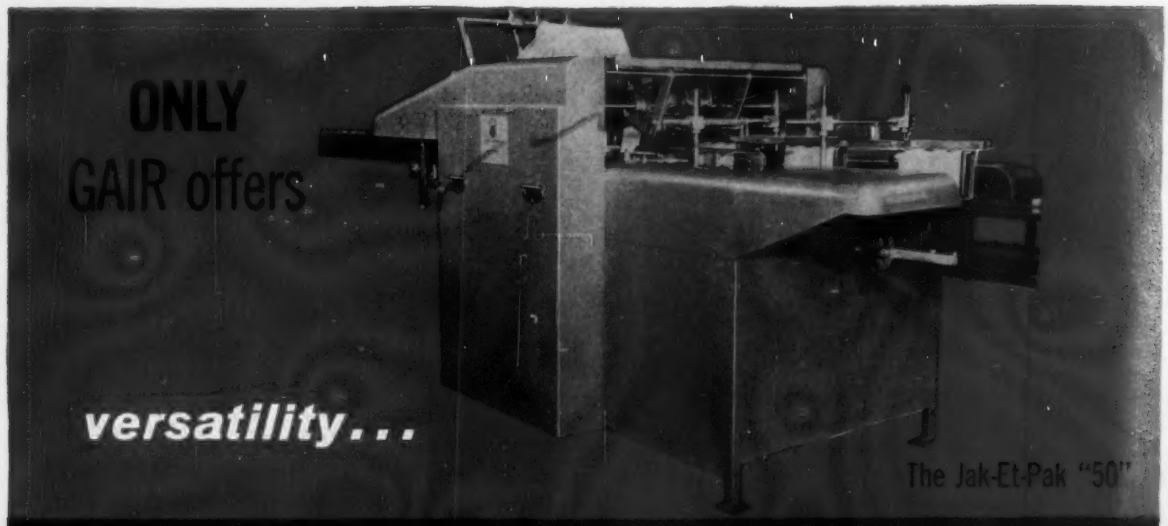
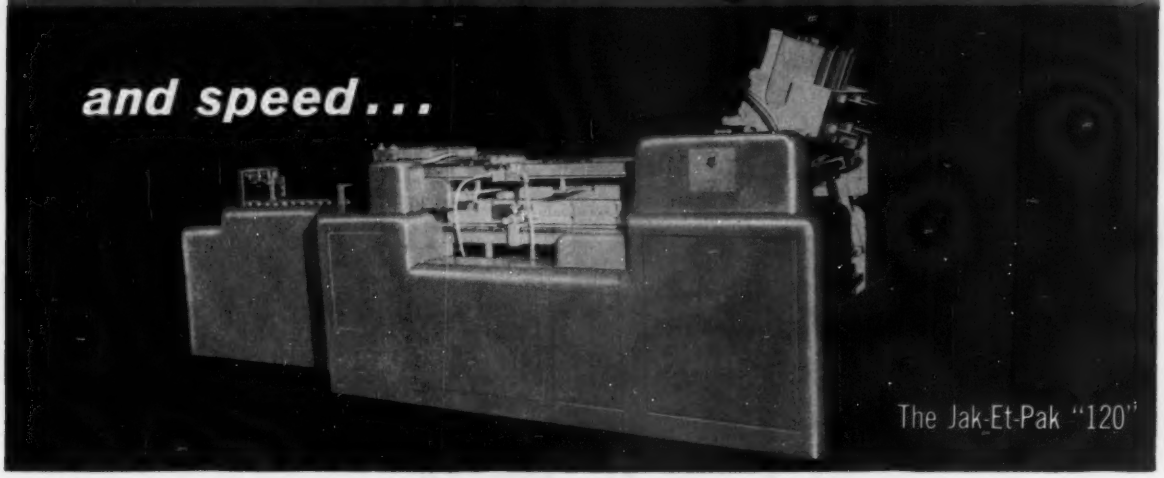


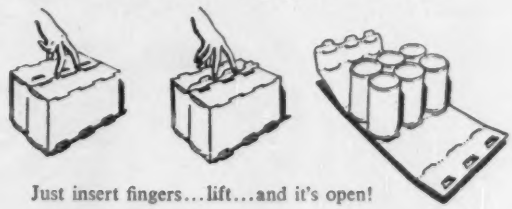




# in multi-pak systems for bottles and cans!

**IF YOU NEED PACKAGING VERSATILITY** to handle bottles, jars, or any one of a wide variety of can shapes and sizes—the amazing Jak-Et-Pak "50" is really a *pocket-sized* dream. It handles double and single-line formations, and can change over from double line to single in less than an hour! New suction feed means no skipping or doubling—and the wide size range means that you can package practically anything, *better!* Yet the "50" is a mere 10'4" long, 4'2" wide, *including the in-feed conveyor!*

**IF YOU NEED PACKAGING SPEED** to handle cans at a fast and furious pace of up to 120 carriers or 720 units per minute, then Jak-Et-Pak "120" offers exceptional production efficiency. And even the amazing "120" requires only ⅓ the space of conventional equipment!

**AND FOR YOUR CUSTOMERS' CONVENIENCE** an ingenious locking mechanism, the exclusive Gair Duo-Lok is built into Jak-Et-Pak systems. Duo-Lok contains *no moving parts*—provides excellent package closure, and extra fast and easy opening to give your multi-paks more merchandising appeal...like this:



Just insert fingers...lift...and it's open!

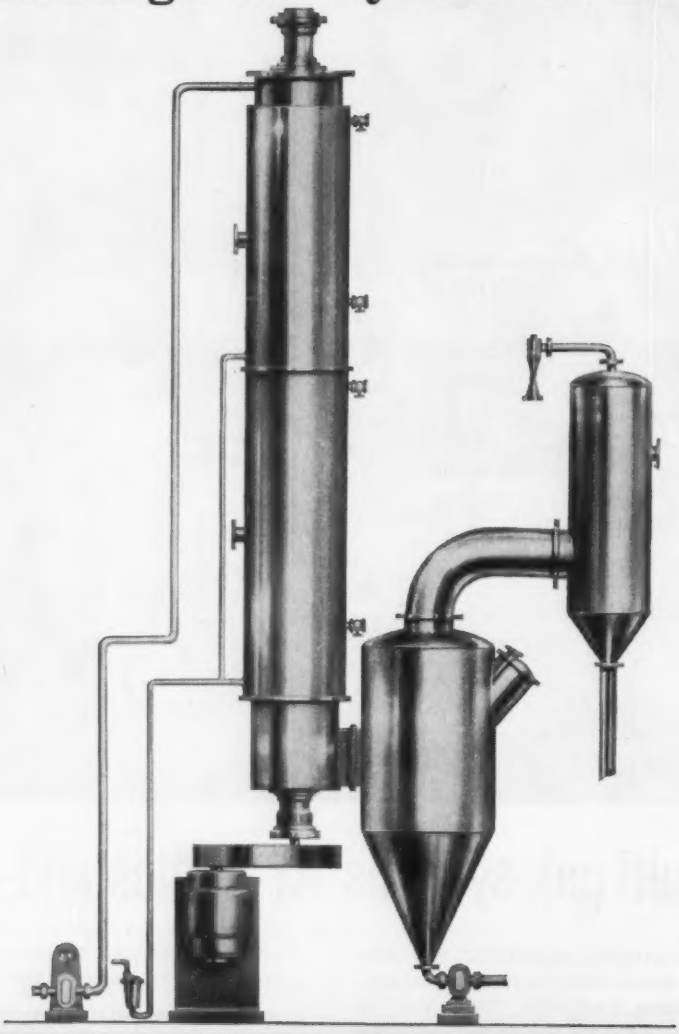
**GAIR**

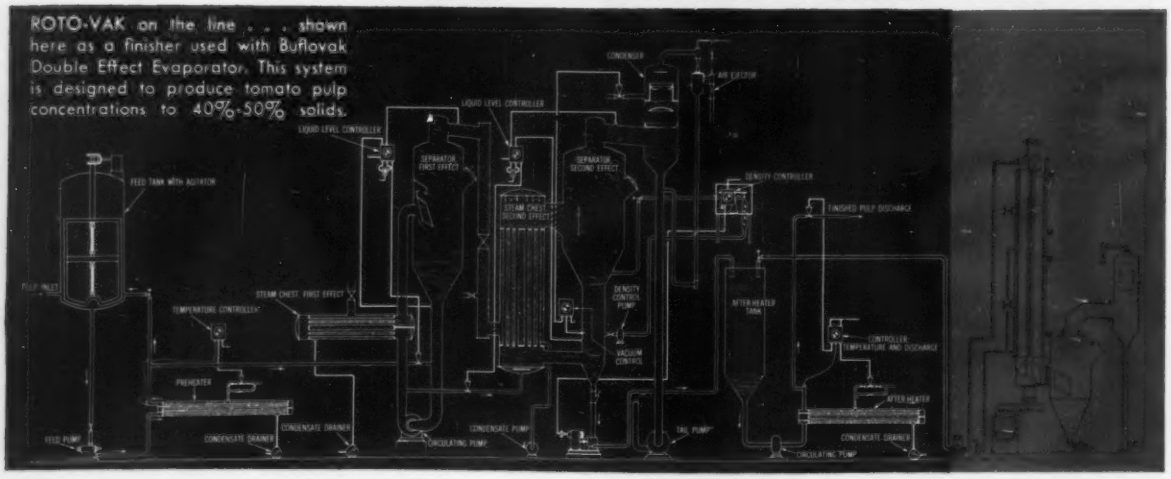
creative engineering in packaging

BOXBOARD & FOLDING CARTON DIVISION OF CONTINENTAL CAN COMPANY • 530 FIFTH AVENUE, NEW YORK 36, N.Y.

# New Buflovak

## . . . provides high density heat transfer . . . helps





# Agitated Film ROTO-VAK

## upgrade product quality . . . cuts production costs

Whatever your product—viscous, foamy or extremely heat-sensitive—the new Buflovak Agitated Film ROTO-VAK will produce a high quality product . . . and build your processing profits.

A product of Buflovak's extensive background in evaporation, this ROTO-VAK permits *high density* concentration of a whole range of new materials. Turbulent, thin film action provides superior heat transfer rates with shortened controlled contact time.

Temperatures formerly regarded as critical for many heat-sensitive products are now practical. For more details of this new advance in profitable processing, write for the new ROTO-VAK Bulletin No. 383.

**Handles any fluid material.** Any material which can be pumped can be processed effectively in Buflovak's new ROTO-VAK.

**External Vapor Separator** provides high efficiency, centrifugal separation. Vapor and product are separated independently from the heating surface. True down-flow design eliminates reflux of product.

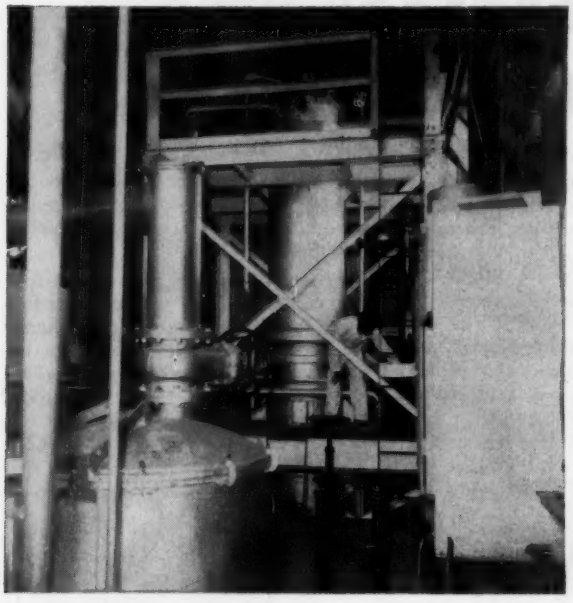
**Main Drive at floor level** affords easy access for maintenance. Located off the center of the rotor, the entire rotor assembly is easily removed when required.

**External Bearings** use well designed mechanical seals or stuffing boxes to eliminate product contamination. Only the rotor assembly contacts the product.

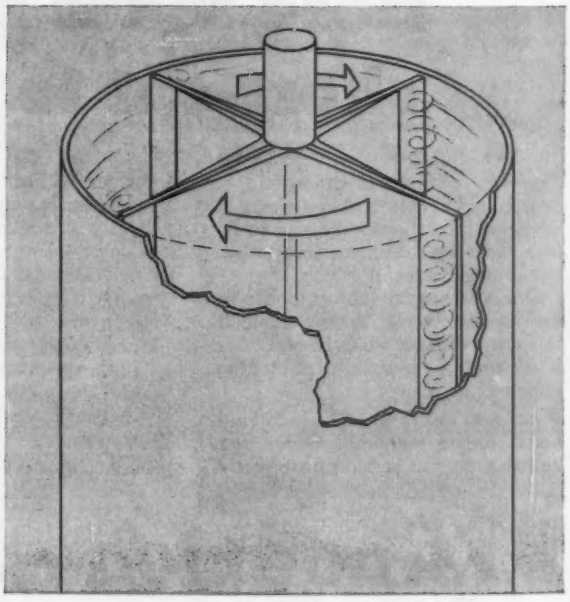
BLAW-KNOX

**BLAW-KNOX COMPANY**
*Buflovak Equipment Division*
*1631 Fillmore Avenue, Buffalo 11, New York*

ROTO-VAK produces tomato paste at 40% to 50% solids. The concentrated product retains its original qualities, is immediately ready for canning. An additional sterilization process is eliminated.



The spinning rotor agitates the down-flowing, thin-film of liquid into a violent turbulent action. Burn-on, and encrustation due to over-heating are eliminated.





For more data, circle 252 on Reader Service Card

B.F.Goodrich

# Hose takes sardines on a short-cut to the cannery

***Problem:*** Sardine fishermen had to haul those heavy nets over the side by hand and then shovel the fish into the boat. That took time and heavy work, and damaged a lot of fish.

One New England canner looked for a way to get his catch back to the docks faster, and without waste. He wondered if fish could be taken aboard by hose, as petroleum is.

***What was done:*** B.F.Goodrich engineers studied the problem and suggested a flexible suction hose that is light, yet will not collapse. It can be handled easily by one man. Using this hose like a vacuum cleaner, fishermen can suck the sardines aboard in a stream of water at a ton-a-minute clip.

***Savings:*** This B.F.Goodrich hose cuts loading time in half, gets fish to the cannery faster and fresher. Boats are able to make more runs out to sea in a season, get more fish—the fisherman and canner make more profit.

***Extra benefits:*** Because this B.F. Goodrich hose is lined with soft rubber, thin-skinned sardines can go through without becoming bruised. Fish reach the cannery in better condition. There's less spoilage.

***Where to buy:*** Your B.F.Goodrich distributor has exact specifications for the B.F.Goodrich hose described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-465, Akron 18, Ohio.*

**B.F.Goodrich *industrial products***

# DEVELOPMENTS TO WATCH

SPECIAL FOOD ENGINEERING SERVICE to EXECUTIVES

**Breakthrough in freeze-drying may come from continuous process** using electronic heater. General Electric is pilot testing with various foods. More effective coupling of r-f energy into load (food), and sensing temperature and condition of food in process are keys to better performance.

**Continuous hydrostatic sterilizers are being installed by Heinz** in Canada, by two canners in Australia, one in South Africa. Cans are conveyed through tall hot-water and steam chambers at rate up to 800 a min.

**Cheddar cheese making has been mechanized to minimize labor** and cut process time 20%. Cooked curds are continuously strained in converted pea washer, pressed, cut, milled, salt-sprayed, and hooped.

**In new process, cottage cheese is "homogenized" in cake-batter** mixer to consistency of sour cream, then is variously flavored (with blue cheese, for example) to make something new in salad dressing.

**Continuous bread-dough process, in test operation by New Jersey bakery** for considerable time, now is offered to industry by AMF.

**Grape concentrate density is controlled by nuclear radiation device.** Tartrate is removed in process by high-speed centrifuge, replacing slower, more costly removal by refrigeration.

**In new continuous sausage process, meat is ground, mixed with spices,** then pumped to comminutor, to receiving tanks, and to stuffing nozzles.

**Rapid in-stream chemical determinations are made by untrained personnel** using new low-cost colorimetric analyzer. Sample and reagent are automatically metered. Photocell process control is available.

**"Electronic brain" using static electrical memory units permits** pushbutton programming of package flow through complex handling system.

**Delivery truck which straddles and carries pre-loaded 240-case** beverage container is concept of Clark Equipment Co. Full cases are pulled from one end, empties loaded into other.

**Tomato concentrate is being shipped in glass-lined tank cars** from Heinz plant at Tracy, Calif., following successful experiments last season.

**Damage to canned foods in rail transit has been reduced 80%** by cushioning horizontal impact and recoil. Car body and load move a few inches relative to chassis, as hydraulically squeezed interleaved plates absorb shock.

See Washington Report p. 21

**Starch with cross-linked molecules and unusual properties** has been produced through USDA research. It is thickening agent which does not gel.

**Nestle plans to introduce line of 12 gourmet foods,** and in setting up distribution company will not exclude supermarkets.

**Portion-measuring valves have been developed for pressure containers.** A steel ball rests on cross-pin in valve tube. Ball raises to valve inlet and stops flow after product above it in tube has been dispensed.

*SEE NEXT PAGE* ➔

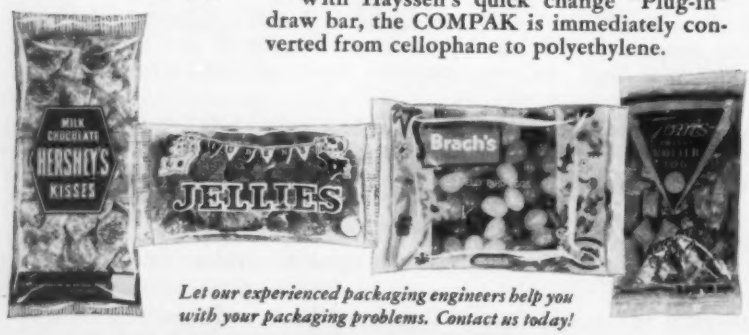
Heide depends on COMPAK for COMPLETELY AUTOMATIC PACKAGING!

The Henry Heide Company installation of the Model "F" COMPAK, with Net Weight Scale Feed.

From hopper to shipping carton, Henry Heide candies are more accurately and economically packaged by the completely automatic Hayssen COMPAK.

COMPAK forms the bag from roll film, with perfect electric eye registration of printed design, and automatically fills from precision scale feed.

With Hayssen's quick change "Plug-in" draw bar, the COMPAK is immediately converted from cellophane to polyethylene.




*Let our experienced packaging engineers help you with your packaging problems. Contact us today!*

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Atlanta • Boston • Chicago • Denver • Detroit • Jackson, Miss. • Kansas City • Los Angeles
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## Developments to Watch

**Swift is introducing a low-calorie, low-cost, cheddar-like cheese spread.**

**Prepared mix for making Irish** soda bread has been introduced in the U. S.

**Bread is baked in wrapper,** special heat-resistant cellophane, in Germany. Higher-moisture loaves and lower production costs are benefits.

**Tinted polyethylene** extruded to base of sulfite paper makes attractive new Marathon bread wrap. It is good air-moisture barrier.

**Polyethylene with extruded-in** colored stripes is recent innovation.

**New easy-pull end-label** provides quick opener for bread wrappers.

**Six to 12 beverage bottles** are held by necks in new pliable plastic carrier. Proved in use by Dr. Pepper, returnable unit made up to 200 trips, outsold paper carriers in tests. It is loaded automatically.

**Wild rice, one-time luxury,** is sold for 79¢ per 10-oz. can by Chun King.

**Single-strength grapefruit juice** with Sucaryl is being test-marketed.

## Schedule of Events

**November**

17-20—American Bottlers of Carbonated Beverages, annual convention & exhibit; Convention Hall, Atlantic City.

17-21—Master Brewers Assn. of America, annual convention; Hotels Fontainbleau & Eden Roc, Miami Beach, Fla.

17-21—National Plastics Exposition; International Amphitheater, Chicago.

**December**

1- 5—Exposition of Power & Mechanical Engineering; Coliseum, New York City.

2- 6—Exposition of Chemical Industries; Coliseum, New York City.

7-13—Dairy Industries Exposition, Navy Pier, Chicago. Annual meetings: Milk Industry Foundation, Sherman Hotel, (7-10); International Assn. of Ice Cream Mfrs., Conrad Hilton Hotel, (10-12).

12-13—National Preservers Assn., annual meeting; Conrad Hilton Hotel, Chicago.

13—National Food Brokers Assn., sales conference; Palmer House, Chicago.



For more data, circle 254 on Reader Service Card

So much for so little...

SHULTON

# VANILLIN and VANITROPE*

**Vanillin**... of the very highest quality, Shulton Vanillin, U.S.P., is controlled throughout its manufacture to rigid flavor standards, and is highly recommended for foods and beverages of superior quality.

**Vanitrope***... a proven economy standard, 25 times stronger than vanillin, yet saving you up to 50% in flavor costs, is ideal for enhancing flavor, its rich, sweet aroma being remarkably like that of the freshly-cut, cured vanilla bean.

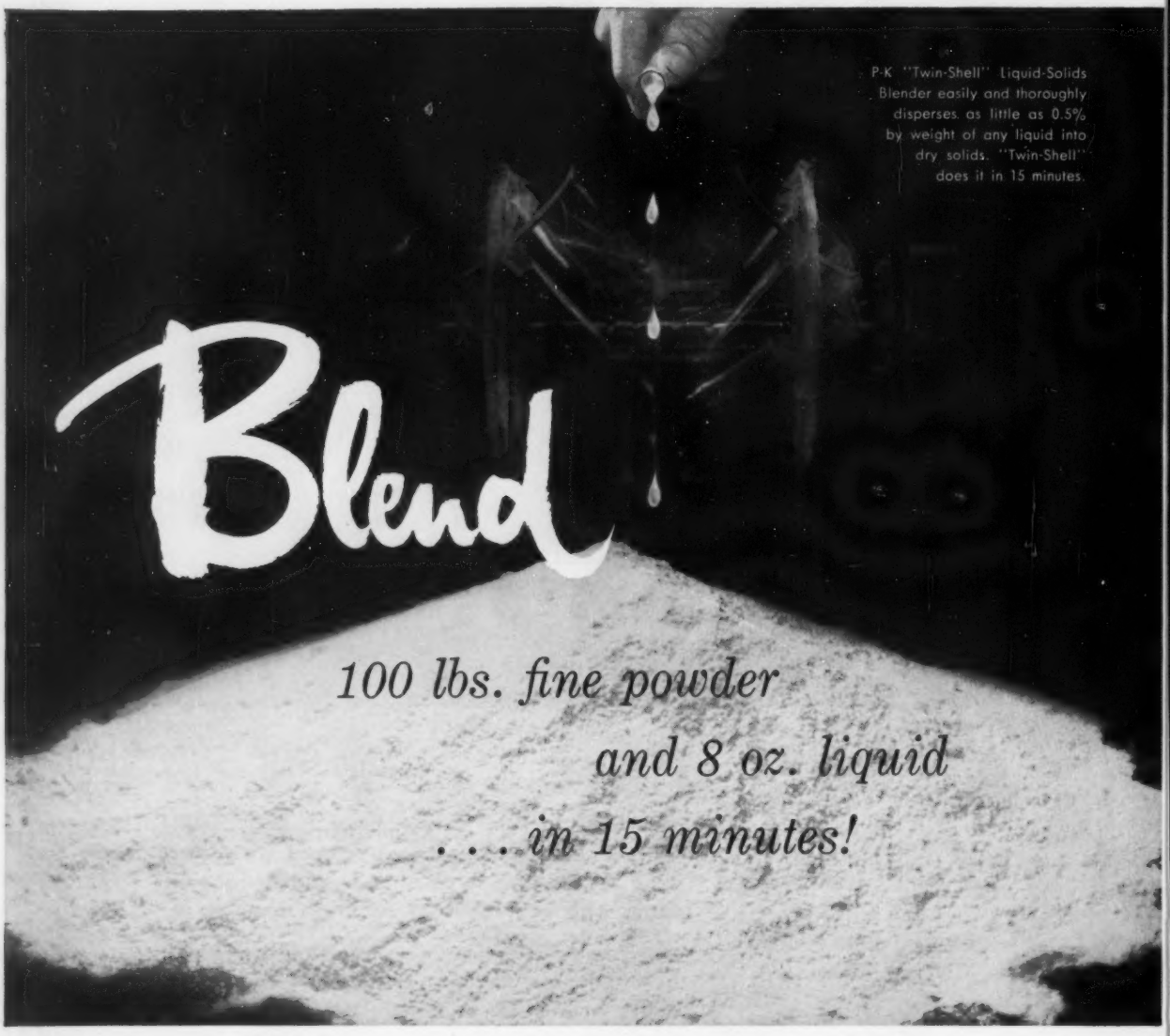
**Vanillin & Vanitrope***... the finest vanilla-type flavor ingredients you can buy, work well together, or alone, and can easily be incorporated into your formulas.

**Technical data, samples, and additional information, on request.**

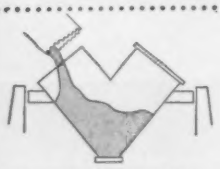
*T. M. REG. BRAND OF PROPENYL GUAETHOL.

SHULTON
FINE CHEMICALS

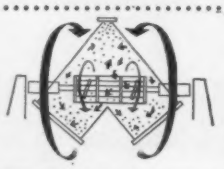
FINE CHEMICALS DIVISION
SHULTON, INC.
ROCKEFELLER CENTER
NEW YORK


P-K "Twin-Shell" Liquid-Solids Blender easily and thoroughly disperses as little as 0.5% by weight of any liquid into dry solids. "Twin-Shell" does it in 15 minutes.
Blend
100 lbs. fine powder
and 8 oz. liquid
. . . . in 15 minutes!

With the P-K "Twin-Shell" Blender the process industries can eliminate such post-blending operations as pulverizing and screening, with their time-consuming materials handling. Blending time itself is cut from hours to minutes. And some hitherto impossible blends are achieved easily with the P-K "Twin-Shell." Here's how "Twin-Shell's" unique design speeds processing:

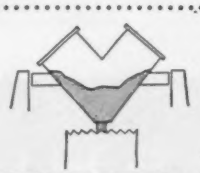


**CHARGE DRY SOLIDS** through top of either shell. Optimum charge level for most materials is about 65% of total shell volume.



**TUMBLE AND AERATE.** As shell revolves, rapidly spinning wire cage intensifier breaks up agglomerates, literally creates dust storm in material.

**ADD LIQUID.** Centrifugal force sprays atomized liquid from periphery of control discs on Liquid-Feed Bar into finely dispersed solids.



**DISCHARGE PRODUCT** easily through apex of shells. Accessibility of interior and easy removal of Liquid-Feed Bar speed cleaning.

*See this new concept in blending! Accept this invitation...*

# *Get new ideas for your blending process at P-K's Pre-Test Lab*

P-K Process Executive welcomes visitor to Pre-Test Lab at East Stroudsburg, Pa. Lab is equipped and staffed to make, or help you make, conclusive tests of blenders with your own materials.

**Phone Stroudsburg 820 and arrange to make comparison tests – using your own formulations – at P-K's Pre-Test Lab.**

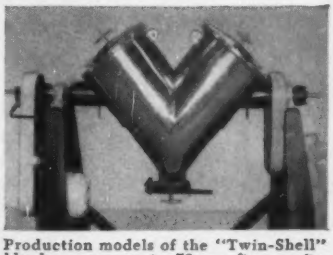
P-K makes practically all kinds of blenders – conventional types as well as the radically different "Twin-Shell." Thus, P-K can give you impartial help in selecting the correct blending process for your needs.

But, blending is full of variables; don't decide on *any* blending equipment or process until you pre-test it with your own formulations. The Pre-Test Lab offers you an opportunity to do this with the aid of skilled blending technicans and proper equipment . . . and without obligation, of course.

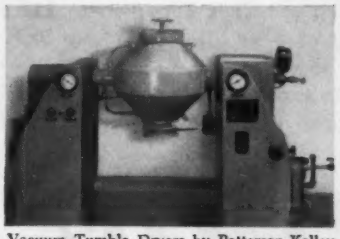
You simply bring or send your materials to the Lab. Here the correct blending procedure and equipment for *your* job are determined by extensive tests. You receive a comprehensive report that can become the basis for an informed selection.

## TEST YOUR MIX WITH EQUIPMENT LIKE THIS

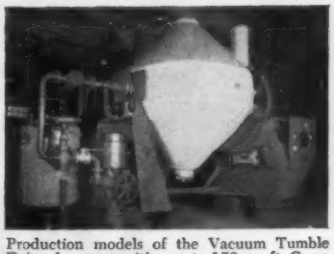
"Twin-Shell" Liquid-Solids laboratory models are made in transparent Lucite or stainless steel, in 8 and 16 quart sizes.



Production models of the "Twin-Shell" blender range up to 50 cu. ft. capacity. (Intensifier and Liquid-Feed Bar optional.)



Vacuum Tumble Dryers by Patterson-Kelley are available in sizes down to the standard 1 cu. ft. capacity lab model.



Production models of the Vacuum Tumble Driers have capacities up to 150 cu. ft. Come factory aligned, piped, instrumented.

## *You're invited*

to pre-test your own formulations at the Pre-Test Lab. Write – or better yet, phone – Russell Dotter at P-K to set a date. (The number: Stroudsburg 820.) He will tell you how much of your materials to bring and will give you other details.

If you can't spare the time, send your materials anyway. But try to see the tests for yourself. If your process includes precision blending, your visit will be worth your while. The Patterson-Kelley Co., Inc., 2011 Hanson St., East Stroudsburg, Pa. (in the heart of Pennsylvania's scenic Pocono Mountains).

**Patterson Kelley**
Chemical and Process Division



For more data, circle 256 on Reader Service Card

OFF THE SHELF–

NO REBORING–

NO KEYSEATING–

# NO WAITING!

**TAPER-LOCK SPROCKETS**
***SINGLE AND DOUBLE STRAND!***

NOW Taper-Lock *Double* Strand Sprockets are available—from stock—ready for the shaft without re-machining!

They offer all the advantages of Taper-Lock mounting. Easy on! Easy off! Precision machined at the factory, they come to you with accurate, concentric bores —insuring full contact between hub and shaft. Taper-Lock grips with the firmness of a shrunk-on fit!

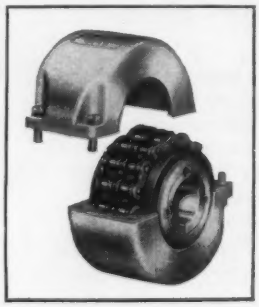
There is no flange, no collar, no protruding part. Flush design means *safety*... If the sprocket becomes worn, you replace only the tooth part. The bushing is used again and again. And Taper-Lock bushings are interchangeable in Dodge Taper-Lock Sheaves, Couplings and Conveyor Pulleys!

Taper-Lock Sprockets and Dodge Roller Chain (made to ASA standards) are stocked by Dodge distributors. Single Strand sizes range from No. 40 to No. 160, up to 112 teeth; Double Strand from No. 40-2 to 80-2, up to 102 teeth. Write for Bulletin A-644 containing selection, installation and maintenance data.

DODGE MANUFACTURING CORPORATION
2800 Union Street, Mishawaka, Indiana

**DODGE**
*of Mishawaka, Ind.*

**CALL THE TRANSMISSIONEER,** your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."



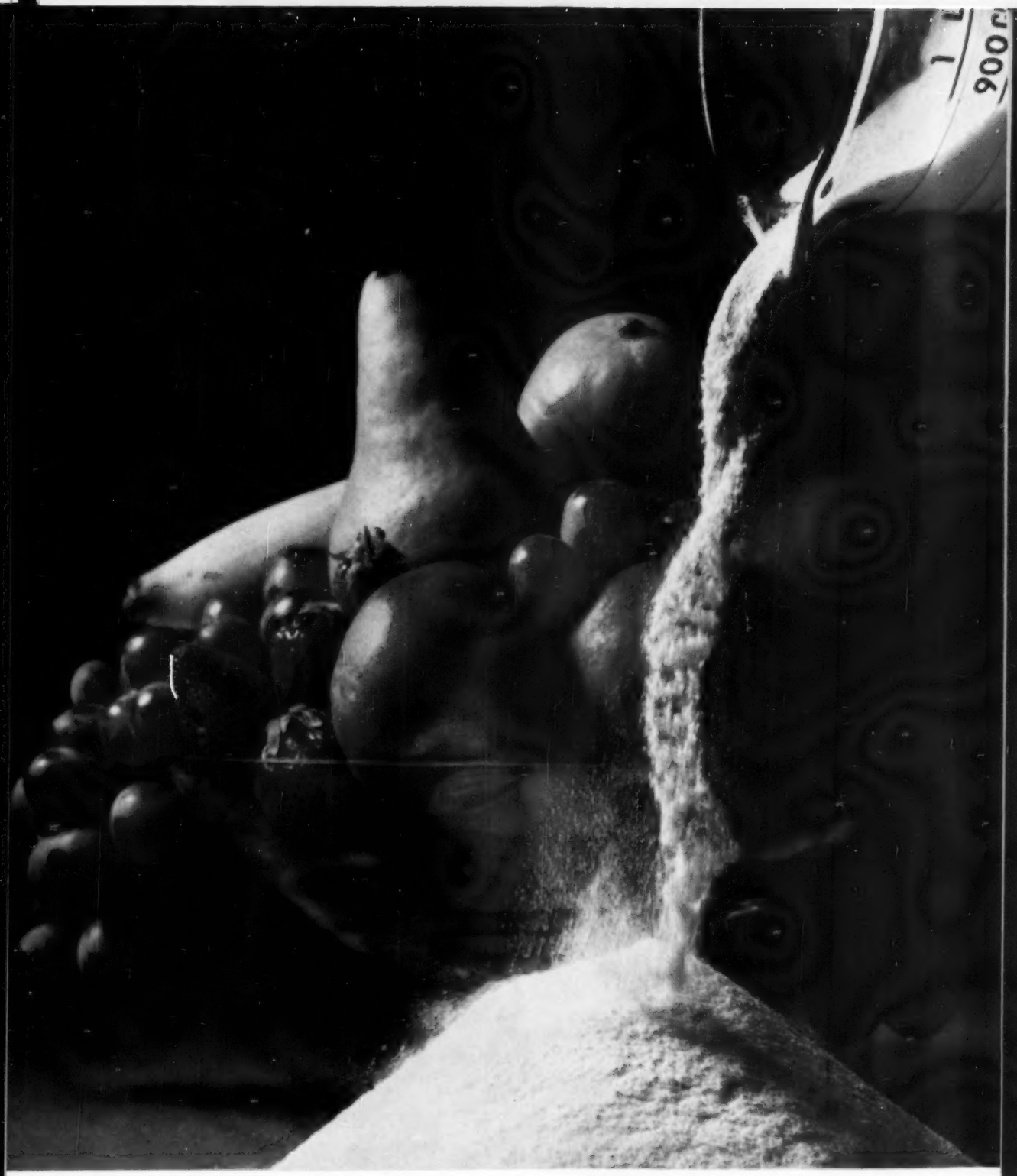
**TAPER-LOCK CHAIN COUPLING**

Accommodates common minor shaft misalignments. Provides strong, compact coupling. Available with covers, for appearance, safety, dirt protection and lubrication—which increases coupling life.



For more data, circle 257 on Reader Service Card

For more data, circle 258 on Reader Service Card



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New and improved techniques of process drying, exclusively employed by Firmenich, yield powdered flavors that flow freely, are dust free, and give you the finest precision in flavoring your products. These important developments in quality flavoring will improve the taste appeal of your products . . . extend their shelf life . . . give them package-to-package uniformity that captures customer preference. Samples of Firmenich Powdered Flavors, with technical information on their practical application, on request.

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# Simplicity in steam traps can effect big savings in parts inventory and maintenance time

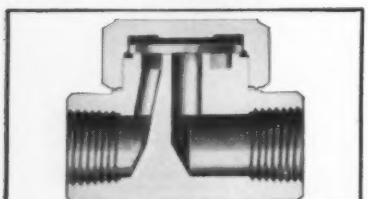
*by John W. Ritter, Test Engineer*
*SARCO Company, Inc.*

The function of all steam traps is to release condensate and prevent steam loss. However, the method of trapping can make a great difference in cost and effectiveness.

In the Sarco Thermo-Dynamic Steam Trap, the method is fundamental. Air or condensate entering the trap must flow from the inlet tube, radially across the underside of the disc valve, to the outlet. The space between the inlet tube and the disc forms a nozzle in which the static pressure energy of the incoming fluid is partly changed to velocity across the underside of the disc, with a resultant *decrease* in pressure. (This will be recognized, of course, as the Bernoulli Principle.) Use of this fundamental method means reliability in operation.

As the high velocity fluid jet strikes the side of the upper chamber, some recompression takes place, so that the pressure above the disc becomes greater than the pressure below it. The pressure reduction under the disc and the pressure recovery above it depend on the internal energy of the fluid. As the condensate above nearly approaches steam temperature, its internal energy is enough to overcome the upward force at the inlet tube and the disc snaps down in the inlet tube, which is the inlet valve seat.

Simultaneously, the disc also seals the outer ring, which isolates the space above the disc from the outlet. The disc valve is therefore held firmly against the inlet valve seat until the pressure in the control chamber is reduced by condensation. The upward force then exceeds the downward force and the disc valve opens.



This 3-part Sarco TD Steam Trap has only one moving part—the hardened, polished stainless steel disc.

No other trap uses the velocity of the fluid to operate the valve or uses the recompression of the flowing fluid to trap the valve closed and to hold it closed. When it closes, it closes tightly – no "operating steam" leaks out.

## 40 seconds inspection time— that's all it takes for a SARCO TD Steam Trap

Just back off the cap of a Sarco TD. Lift out its single moving part, the stainless steel disc. Wipe it off, and drop it back. No adjustment is ever required, at any load or any pressure in its range – from 10 through 600 psi.

The TD operates in any position, won't blow steam at any load. Small as a tee fitting, it can be installed in tight places. Its versatility and reliability cut cost of big replacement inventory.

Write for "Literature Kit 2A" today and get latest bulletins on the TD Steam Trap and other Sarco steam traps. Remember that Sarco can give you impartial advice on *Production Planned steam trapping* because . . .

5605-B

**SARCO**
**COMPANY, INC.**
635 Madison Ave., New York 22, N. Y.

*Only Sarco makes all 5 types:*
*Thermostatic • Liquid Expansion • Float Thermostatic*
*Thermo-Dynamic • Bucket*

**STEAM TRAPS • TEMPERATURE CONTROLLERS • STRAINERS • HEATING SPECIALTIES**



For more data, circle 259 on Reader Service Card

## Calls Food Men to Session on FDA

Leading food firm executives have been invited to Washington for a confidential non-holds-barred "gripe session" on operation and policies of FDA. Dec. 11 is the date.

The meeting, arranged by HEW Secretary Arthur Flemming, will give industry men opportunity to air their views on problems and potential improvements in FDA. Specifically suggested are brass-tack discussions of such matters as the Food Additives Amendment, the Pesticide Chemicals Amendment, and food-coloring problems.

Flemming is disturbed at complaints that FDA is not being expanded fast enough to provide the growing services needed by industry and required for consumer protection. Still operating on much the same budget as a year ago, FDA is far behind in its expansion drive. Goal has been a three- or four-fold increase over 1955 strength, as recommended by the Citizens Advisory Committee and approved by Flemming's two HEW predecessors.

Since that time, FDA's responsibilities and workload have increased sharply—most notable through enactment of new laws regulating presticides and food additives.

## Radiation Check Finds Foods Safe

Most foods packed since the start of the atomic age (1945) can be checked off as not reflecting any significant increases in radioactivity.

So reports FDA in revealing the findings of a special study covering thousands of different canned food items and specifically comparing those put up prior to '45 with those processed since.

Tea, certain seafoods, and dairy products were the exceptions that did show increased—but not dangerous—effects of radiation.

The samples of tea, from the 1956-57 harvests, averaged about 30 times greater radioactivity. But FDA quickly noted that only a relatively small fraction (17%) of radioactivity is extracted in a strong brew of tea. And so "it can be concluded that the beverage as commonly consumed would not contain over-tolerance amounts of Sr 90."

Seafood showed a mixed pattern. It trended toward higher radioactivity in 51 samples of miscellaneous fish varieties and 32 samples of oysters and clams. However, shrimp, lobster, and crabs "showed no trend whatsoever."

As for dairy products, a "statistically significant increase in total radioactivity" was noted in fresh fluid milk, evaporated milk, milk powder, and cheese.

## Monopolies, Price Deals Targeted

FTC has just launched an investigation of the growing "integration and concentration of economic power" in the retail distribution of foods.

The Commission says it has been prompted by "many complaints of concentration of power, collusive price action, and unfair competitive methods in the industry."

While the practices of retailers will chiefly be targeted, the FTC goes on to say that its checkup will also concern "wholesalers, manufacturers, brokers, and other distributors, where their activities have a bearing on retailing."

Meantime, non-campaigning Congressmen likewise are busy. Senate anti-trusters, under Sen. Kefauver, have been probing the recent 2c./lb. bread price boost in New York City, looking for evidence of collusion.

Also, a House subcommittee is boring deeper on those charges that companies have bought back Government-stock surpluses at lower prices and then re-sold them to the military at far-higher figures.

## Barter of Surpluses Still Snarled

Just where bartering of surplus foodstuffs stands remains a question.

A stepped-up program had been authorized by Congress wherein domestic crop surpluses could be exchanged for foreign metals and minerals. But USDA's Commodity Credit Corp., named to direct the program, has had a knotty legal problem on its hands.

The fact is that House and Senate conference reports on the measure have differed so sharply that no one in Washington is ready to predict the outcome.

As worded, the law removes all barter restrictions "except to the extent the Secretary finds them necessary to protect normal commercial markets."

On the one hand, House conferees say the language removes USDA's restriction that brokers prove "additionality" in their barter deals—that is, demonstrate that they don't replace normal trade. On the other hand, Senate conferees contend that it does no such thing.

CCC hasn't yet resolved this poser, and meanwhile barter is at a virtual stand-still. As for the brokers, they declare that they're unable to meet USDA's tight requirements for proving "additionality."

## BRIEFS

**"You must raise the import duty on tartaric acid** and cream of tartar. Otherwise we'll be out of business." So says appeal to Tariff Commission by Stauffer Chemical Co., sole U.S. producer, which wants 6c./lb. levy doubled. Importers are opposed, contending they need 15% price advantage to compete with premium domestic product. And they argue that Stauffer's sales decline is really due to major users' trend to citric acid.

**Ingredient and labeling standards for peanut butter** are now imminent. Makers got this flat statement from FDA Commissioner Larrick following recent marketing of "inadequately labeled" butter made with high percentage of cheaper vegetable oil and artificially flavored.

**Promotion of patent and trademark protection** for our foods in overseas markets was goal of U.S. delegation to 45-nation meeting just closed in Lisbon. Many countries have been refusing to afford Americans such industrial safeguards, despite fact that their own nationals enjoy them when competing over here.

# A PREVIEW

## OF A NEW SOURCE OF QUALITY STAINLESS SHEET & STRIP

Steel buyers everywhere will welcome J & L's new source of constant high quality stainless sheet and strip. The completely new stainless mill, located at Louisville, Ohio, has successfully passed through its shake-down runs and is now ready for *full* capacity production.

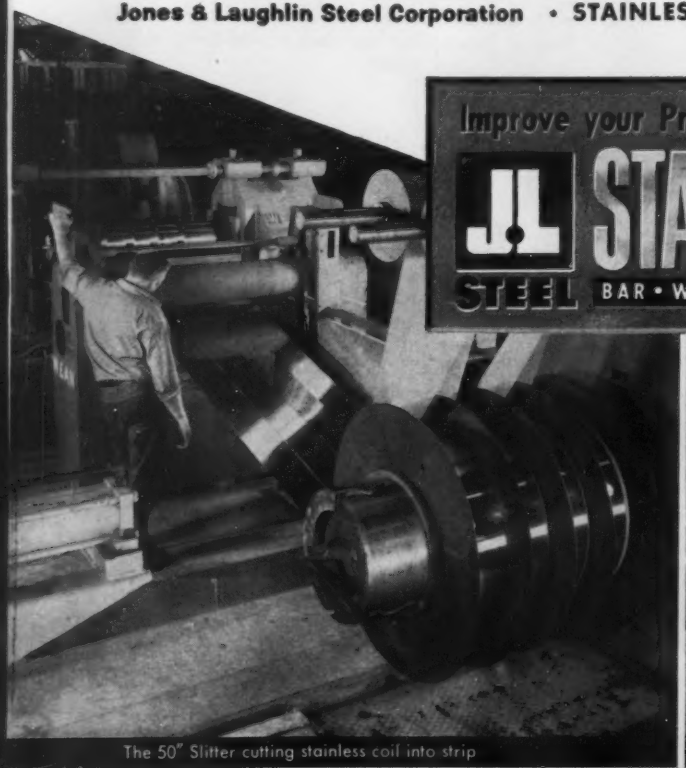
With the completion of this integrated cold rolling operation, J & L is equipped with the finest facilities in the industry to produce stainless steel strip and sheets to extremely close tolerances in widths up to 48 inches. *Write for your copy of J & L's Sheet and Strip Manual today.*

**Jones & Laughlin Steel Corporation • STAINLESS and STRIP DIVISION • Box 4606, Detroit 34**

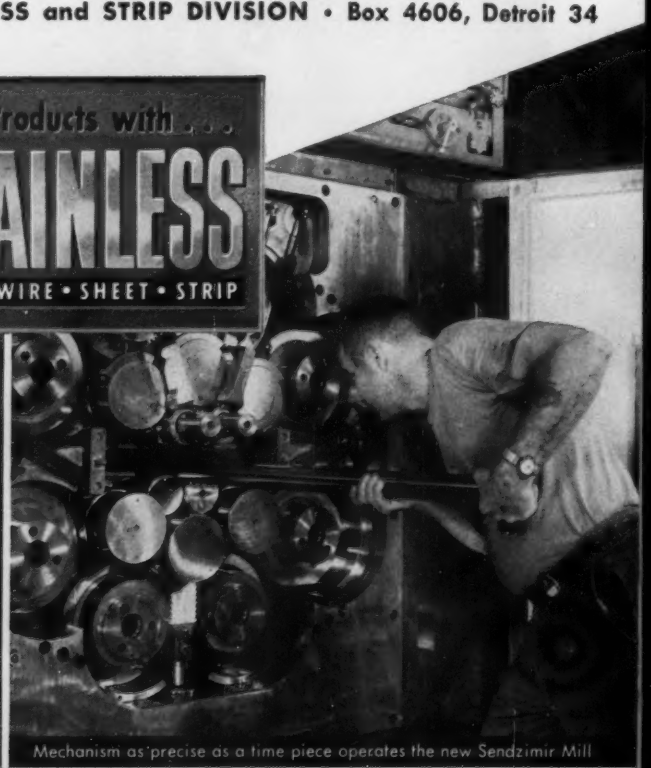
Improve your Products with . . .

J&L STEEL STAINLESS

BAR • WIRE • SHEET • STRIP

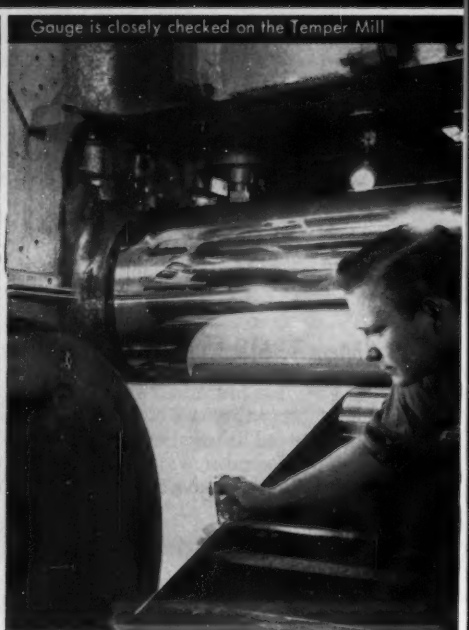


The 50" Slitter cutting stainless coil into strip



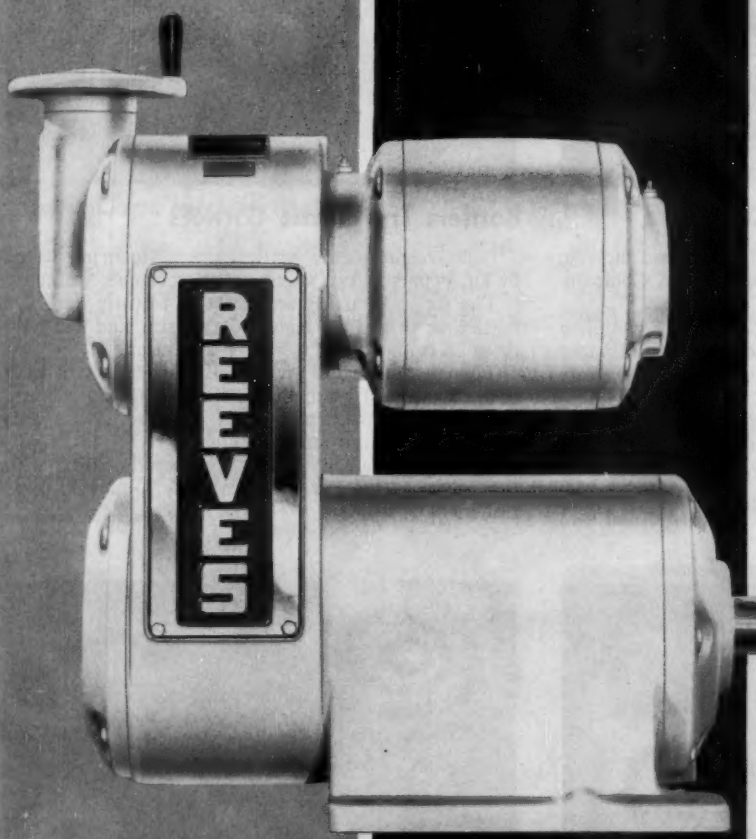
Mechanism as precise as a time piece operates the new Sendzimir Mill

Discharge end of the cold roll anneal and pickle line



Gauge is closely checked on the Temper Mill

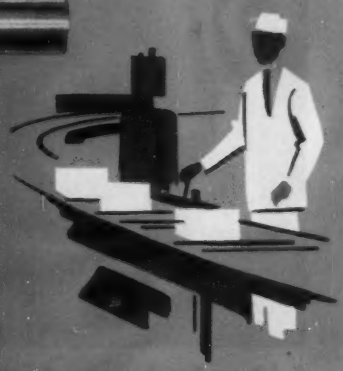
# NEW SANITARY TYPE MOTODRIVE




New from Reeves, a variable speed drive designed specifically for the dairy and food industries. New sanitary design incorporates white enamel finish, special moisture-proof seals at all openings, and self draining, easy-clean exterior contours.

Available in vertical, 45°, or horizontal mounting in either "C" flow or "Z" flow style—fractional through 10 hp. For full details, write for Bulletin No. M 588.

Reeves Sanitary Motodrive is a product of the Reeves Pulley Company, Division of Reliance Electric and Engineering Company, manufacturers of a-c. motors, d-c. motors, Master Gearmotors, Reeves Drives, V*S Drives, generators and electrical control systems.



*REEVES PULLEY COMPANY DIVISION*

MASTER REEVES R

**RELIANCE** ELECTRIC AND ENGINEERING CO.

DEPT. 3711A CLEVELAND 17, OHIO
CANADIAN DIVISION: TORONTO, ONTARIO
Sales Offices and Distributors in Principal Cities

←For more data, circle 260 on Reader Service Card

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# NEW PACKAGES & PRODUCTS

## Foil Sparks New Family Labels

A bold utilization of uncluttered design and metallic color is the feature of the new Armour and Company series of family labels.

Reported to be the first use of foil for a complete product line of a major packer, the change from paper to foil labels comes 15 years after the present labels were designed.

Produced by Raymond Loewy, the labels scored high in pre-market tests for shelf visibility, readability, eye flow, and attention holding quality.

Uses of a main color (Red, blue, or gold) divides the products into three groups. **Circle 1 on Reader Service Card**

## Bottlers Try Plastic Carriers

Light-weight plastic bottle carriers are being tested by Dr. Pepper in two southwestern consumer markets.

The six-pack carriers are designed to carry king size bottles, as well as the regular 6½ oz. size, and will hold three 26 oz. bottles in a staggered position.

Though the carriers are initially higher in cost than the conventional ones, it is believed that an increase in trips per package may offset this cost if the tests prove a high return ratio.

In the same area, Pepsi-Cola is experimenting with the carrier. The carrier is made by Dura-Pak, Inc., Dallas. **Circle 2 on Reader Service Card**

## 5 More From Betty Crocker

More convenience for the housewife is promised in five new products making their debut under General Mills' Betty Crocker label.

Now on the national market is Buttermilk Pancake Mix. Packaged in a 1 lb., 12 oz. carton, the pre-sifted contents are mixed with eggs and milk to prepare.

Two Chiffon Cake Mixes–Cocoa and Orange–need only the addition of two eggs and water to turn out a delicious cake. These mixes are in western and north central markets at present.

Pudding cake mixes are now available nationally. A 10 oz. carton holds either chocolate fudge or lemon flavor. Each carton serves 4-6 people.

## Bread Baked in Own Wrapper

German bakers in Bonn are baking their bread in its own wrapper.

Wolf & Co. of Walsrode are treating normal cellophane so it may be used in baking ovens operating at temperatures up to 520 deg. F. without any fear of the wrap burning. After mechanical kneading and dividing, dough is roughly hand-shaped and placed in its glassine cover prior to entering the baking oven. During the normal baking process, the dough rises and completely fills out the wrapper.

Wolf claims that after oven processing in its glassine wrap, loaf is baked well through and through, has a crisp crust, and will have forfeited none of its tastiness.

## Plastic Caps for Milk Bottles

What is reported to be the first all-plastic milk bottle cap has been developed by Sealright-Oswego Falls Corp., a leading producer of packaging and equipment.

Called the Plasti-Cap, the closure is designed for use on the narrow neck milk bottles of 38mm top rim diameter. About ¼ of glass milk containers now used in the United States are this type. Made of vinyl, the cap removes easily and provides a snug reclosure.

Now on the market, the closure is the first all-plastic Sealright product to be released for general use. The company is experimenting with all-plastic packaging at its Los Angeles plant. **Circle 3 on Reader Service Card**

## Irish Mix Makes Debut

Straight from the "old sod" comes an Irish Soda Bread Mix. Now marketed in the United States by the Dublin firm of Goodbody Ltd., the bread has been baked and served daily in Irish homes for generations.

Boasting a flavor that is described as "robust and biscuity", the bread is prepared by mixing the contents of package with salt, water, then blending with a knife. It is baked for 40 min. at 450 deg.

Besides being served as a bread, the product may be mixed with currants, caraway seeds, or prepared in any of a number of ways described in a recipe booklet included in the package.

## 6th Ready-to Serve Cake

"Old world flavor" is the boast made by the Kitchens of Sara Lee for its 6th ready-to-serve cake: All Butter Cinnamon Nut Coffee Cake.

The result of two years of testing, the new cake is made from Grade AA 93-score butter, fresh full milk, full fresh eggs, imported cinnamon, and pecans.

Cake is baked in the same aluminum foil pan in which it is sold. The pan was specially designed for ease of cutting and serving.

The new product required special equipment to produce it to the baker's rigid specifications. Especially designed equipment is supplemented with hand operations.

## Introduce Slim Size Crackers

Keebler Biscuit Co. has introduced a new slim-size Saltine. Product is being launched with an intensive advertising, promotion and sales program.

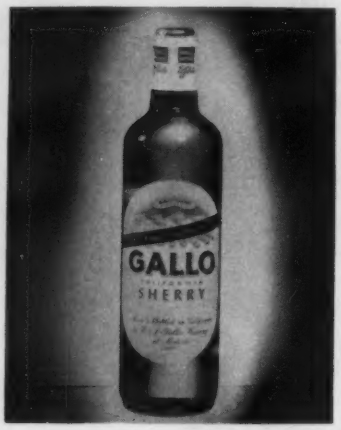
The new cracker is rectangular, smaller and more convenient for serving than the ordinary 2-in. square style. The main theme of the promotion is "For Convenience's Sake."

The new product is packed in a trim white package with red and blue lettering, specially designed for displays. With three sides of the package in white, the fourth panel is printed in red and contains white lettering that calls attention to the "new slim size". The retailer can thus vary his displays.

This Yarway team has scored high—over a million installed on all types of steam equipment. Stocked and sold by 270 Industrial Distributors. For free Steam Trap Book, write YARNALL-WARING Co., 127 Mermaid Ave., Philadelphia 18, Pa.

go YARWAY with confidence

## New Packages & Products




### Wine in Green Glass

A new amber-green glass called Flavor Guard will soon replace the clear "flint" Gallo wine bottles that have been familiar to consumers for many years.

Developed by the vintner, glass is a revolutionary new protective glass for wine bottles with new components that shield wines from injury by flavor-stealing light rays.

First of the 31 Gallo wines to make its bow in Flavor Guard bottles will be Thunderbird, the vintner's new aperitif wine.

### Can Pours or Shakes

Newest packaging development to come from American Can Co. is the 16-oz. paper Shake 'N Pour cannister developed for International Salt Co.

The container features a round, double-purpose top that seats a turning dredge. The dredge has 10 shaker holes on one side and a large pouring hole on the other. A twist converts the cannister from "shaker" to "pourer".

The top is made of copper-colored styrene plastic and is leakproof.

### Packaging Briefs

**Striped Polyethylene** film introduced by Industrial Chemicals Co. offers numerous possibilities for the package designer.

**New Red Wrapper** from Marathon is called Mara-Poly. A sulfite-polyethylene laminate, the wrap is now being tested by several bakers.

**Vertical** labels have been adapted for all 13 of Libby-McNeil and Libby's frozen juice items.

**Good News** for bag manufacturers is Rego Paper Corporation's new Triplex paper. Paper is now being used by Sunshine and Bakers Biscuit Company.

**Transparent,** moisture-proof pouches holding 4 oz. of dried corn are being used by Martin H. Cope Co.

### Hash a la Francais

Corned beef hash with a French touch is the newest food product of Claridge Food Co., New York.

The processor commissioned an internationally-known chef to design a corned-beef hash with "subtle spicing". The new product is marketed in 15½ oz. cans.

### New Product Shorts

**Frozen Italian** delicacies line has been introduced in New York Metropolitan area by Elegante Food Products, Inc. Line will include meat ravioli and cheese ravioli, meat sauce, tomato sauce, and lasagna.

**Introduced** by Stokely-Camp are frozen creamed chicken and biscuits, spinach souffle, and corned beef with barbecue sauce.

# Riegel

## Announces

# NEW TRI-PLEX PAPER

## for Semi-Rigid Bags

*Ask your bag supplier to show you this new packaging development*

**(RIEGEL DOES NOT MAKE BAGS)**

Tri-plex is an unusual combination of three special Riegel packaging papers laminated together to form one sheet with superior rigidity for high speed production of semi-rigid bags. It's a brand new Riegel development, ideal for things like cookies and crackers. Makes a fine protective bag that stacks well and holds its shape. Excellent grease-proofness. Shortening will not wick through seams, folds and creases. High moisture protection keeps cookies crisp longer.

Riegel's Tri-plex has an excellent white surface for fine printing results. Bags can be supplied with heat-sealed closures. We believe Tri-plex now provides your bag maker with a truly superior material . . . at an attractive price.

BAGS COURTESY OF:
*Arkell & Smiths, Hudson Falls, N.Y.*

**Riegel**

**PROTECTIVE PACKAGING MATERIALS**

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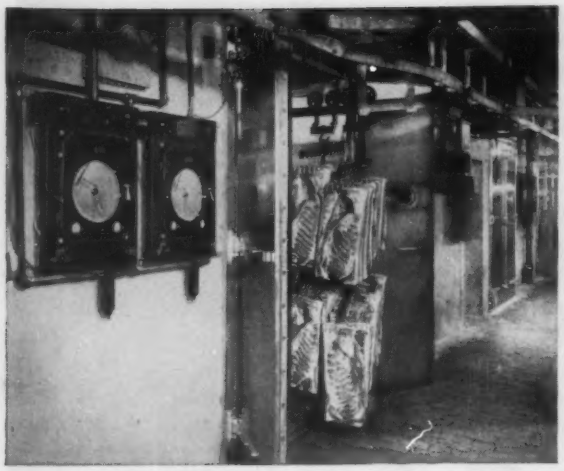
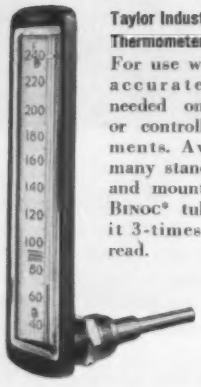
For more data, circle 263 on Reader Service Card



**TAYLOR SMOKEHOUSE CONTROLS** regulate smoke, humidity and temperature. A FULSCOPE* Recording Wet-and-Dry-Bulb Controller maintains desired moisture content and temperature in each house. Smoke density is regulated by dampers in ducts from smoke unit. System insures minimum shrinkage, minimum smoking time, uniform flavor and product quality. Hundreds in service.

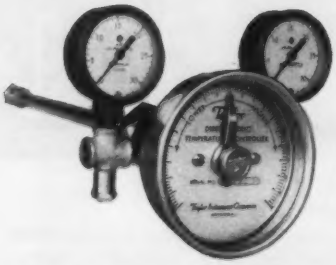
**TAYLOR SWP 7AV RETORT SYSTEM** pictured above gives *completely automatic control* for either steam or water cooking, with or without pressure cooling. Can be changed from one to another in minutes. Operator simply sets pre-heat temperature and presses button; loads retort; sets cook temperature and presses start button. Taylor controls operate entire cook.

# Fully automatic control system YOU CAN DEPEND ON



**Taylor Industrial Thermometer.**
For use wherever an accurate check is needed on recording or controlling instruments. Available in many standard ranges and mounting angles. BINOC* tubing makes it 3-times-easier-to-read.

*Trade-Mark

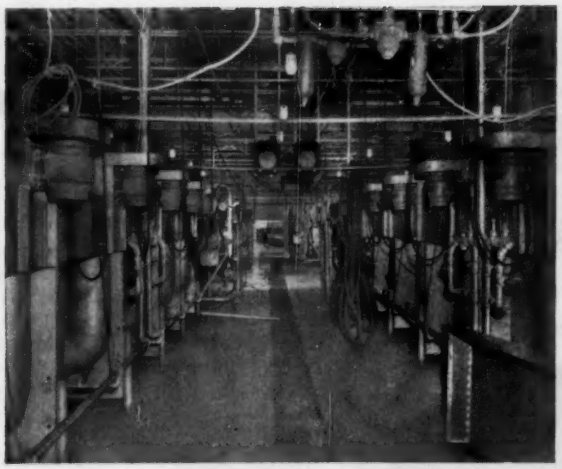


**Expansion Stem Temperature Controller.**
For use on open tanks, sterilizers, hot water heaters, scalders, cookers, etc. Suitable wherever a capillary type controller is not required; and where there is sufficient space for the 12" rigid expansion stem. Reverse or direct acting.

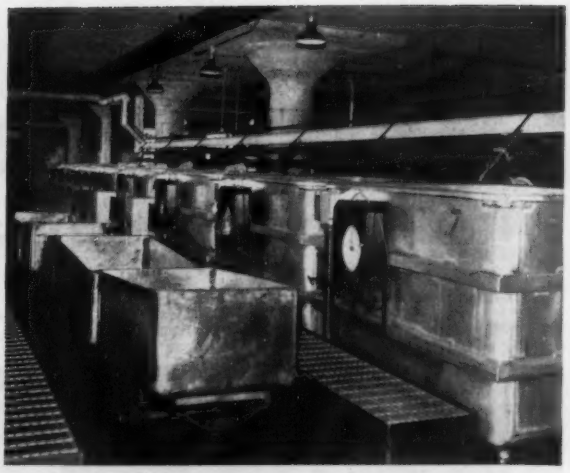
**BI-THERM* Dial Thermometer.**
A quick, reliable temperature indicator, ideal for any application where an easy-reading, low cost, direct connection thermometer is desired. Accurate to ±1% of scale. Silicone-damped to improve speed of response. All-welded stainless steel construction.

*Ask your Taylor Field Engineer or write for Catalog 500 MP.*

**Taylor Instruments**



**TAYLOR POULTRY SCALDING CONTROLS** insure uniform temperature throughout the tanks. A FULSCOPE Recording Controller maintains precise temperatures in the first half of each tank and an Indicating Controller (not shown) regulates temperature at the other end. Result—water is kept constantly hot enough for easy removal of feathers without skin discoloration.

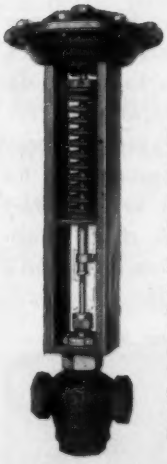


**TAYLOR HAM BOILING CONTROL SYSTEM** for open tank cookers uses the FULSCOPE Limited Range Recording Controller to maintain precisely the proper boiling temperature. Insures a top quality uniform product, with minimum shrinkage, at the lowest possible cost. Keeping-quality is also improved. Chart record serves as double check on this vital phase of processing.

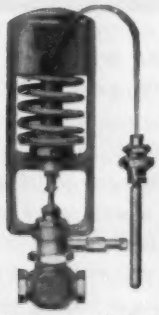
# or simple thermometer . . .

# TAYLOR DEPENDABILITY!

**FULSCOPE Recording Temperature Controller.**
Automatically maintains temperature and keeps chart record of process, necessary for top production efficiency. Eliminates haphazard manual operation. Ideal for controlling and recording temperatures on storage rooms, open tanks, retorts, open cookers, and sterilizers.



**HI-FLOW® Motosteel Evenaction Diaphragm Valve.**
Provides smooth, quick-acting, positive valve position, in response to changes in air pressure from the controller. Designed for a long service life with a minimum of shock and strain. Requires very little maintenance.



**Self-Acting Temperature Controller.**
A simple, rugged controller, requiring no pneumatic or electric service. Ideal for use on hot water service tanks or wherever temperature of the medium is not lower than 10°F. Ranges: 110 to 170°F., 130 to 190°F., 170 to 240°F. and others.

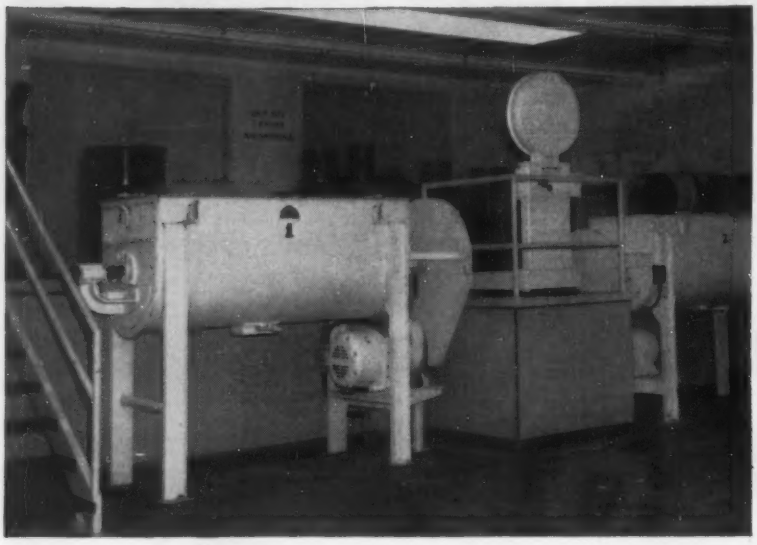
*Taylor Instrument Companies, Rochester, N.Y., or Toronto, Ontario.*

VISION • INGENUITY • DEPENDABILITY

**MEAN ACCURACY FIRST**

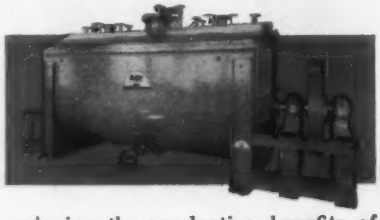
# DAY mixes
## in the best companies

Fearn Foods Inc. is one of thousands of old friends. They've used DAY Ribbon Blenders for years in their Franklin Park, Illinois, plant.



When the decision on what make of blenders to buy for their new modern Los Angeles plant came up, they just ordered three more DAY blenders. The reason — simply that DAY blenders have always given dependable trouble-free service. They operate smoothly, rapidly and efficiently. Their many features include outboard bearings that provide sturdy support for a solid alloy steel shaft. Stuffing boxes of sanitary seals for protecting bearings, prevent product contamination. They have a geared head motor, roller chain drive, galvanized or stainless tank, choice of agitators. Heating or cooling jackets optional. There is a complete line of DAY ribbon blenders available in capacities of 10 to 465 gal.

On the right is a DAY mixer from the Jumbo line. These rugged brutes are built for extra heavy loads. Capacities 600 to 3850 gal. Complete lab facilities available for testing your product.



Join the many companies now enjoying the production benefits of DAY blenders and mixers. Write today for Bulletin 800.

*The* **J. H. DAY** *Co.*

*Division of The Cleveland Automatic Machine Co.*

SERVING THE PROCESS INDUSTRY SINCE 1887


# COMMENTS & QUESTIONS

### Private Label Impact

Dear Editor:

I commend the article, "Private Labels Climb Into Key Marketing Positions," published by FOOD ENGINEERING. It spotlights an important area of genuine concern and interest to all thinking people in the food business—whether they purvey nationally advertised or privately controlled brands.

Articles of this type always are of interest and help.—*Wesby R. Parker, President, Dr. Pepper Co, Dallas, Tex.*

Dear Editor:

Articles of the type you recently published on private vs. brand labels are of interest to us, as indeed are almost all of the articles in FOOD ENGINEERING. Another that particularly stands out in my mind is the one covering advancements in quick tenderizing and how they may affect the meat packer.

Yours is one of our most favorite publications. It is a pleasure to tell you that we think you are doing an excellent service job.—*John H. Pugh, Assistant to the President, Adolph's Ltd, Burbank, Calif.*

Dear Editor:

Your private label article is of very considerable interest to us.—*Robert H. Bennett, Vice-President, General Foods Corp, White Plains, N. Y.*

Dear Editor:

I congratulate you on the very complete and thoughtful article you wrote on our private label operation. We are very pleased with it.—*George Doherty, Assistant General Manager, Topco Associates, Inc, Chicago.*

### Don't Fear Automation

Dear Editor:

As a small company, we are moving quite rapidly into the relatively limited opportunities for automation and mechanization which our industry presents.

The people who are afraid of automation remind me of the people who are afraid of ghosts. Because of fear they never go into that haunted house, and because of fear some folks don't go into automation.

Actually, there aren't any ghosts in the haunted house, and there

**Beverage prepared from the spicewood bush by brewing its twigs. Used by Indians, and early pioneers.*

# * SPICEWOOD TEA WAS ALWAYS AVAILABLE but You Had to Cook a Bush!

A common beverage of the American pioneer was "spicewood tea", made by steeping the twigs of this bush in hot water. Always available, the drink was undoubtedly a boon to our hardy, and hard-working ancestors... but the modern American housewife demands *convenience* and *taste-appeal*, as well as availablity. And, today's beverages, through the twin mediums of advance processing and the techniques of spray drying flavors, offer both. The DOLCOSEAL LINE... trade-famous D&O group of locked-in flavors, make possible the marketing of *soft drink powders* and *tablets*, *summer-ades* and *ice cream mixes* and *powdered malt and milk drinks* that will withstand the most extended shelf life and still deliver to the ultimate consumer a full, fresh, rich and natural flavor. Available in *essential oils*, *oleoresins*, *aromatic chemicals* and *complete fruit and specialty flavor* lines, DOLCOSEAL spray dried FLAVORS plus modern processing are the "convenience age" answer to "spicewood tea".

*Write for copy of "The Changing World of Food" and new "Reference Book and Catalog of Flavors and Seasonings"*

*Essentially for You!*

D&O ESTABLISHED 1798

OUR 160th YEAR OF SERVICE

**DODGE & OLCOTT, INC.**

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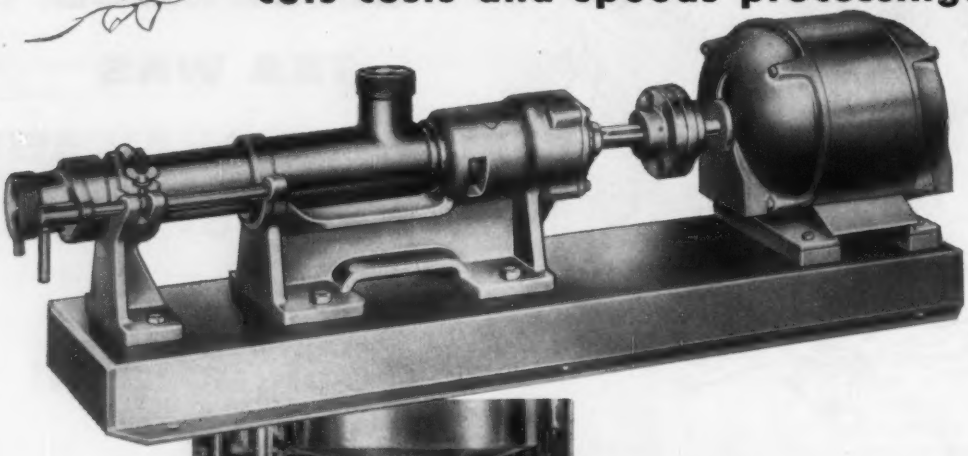
Sales Offices in Principal Cities

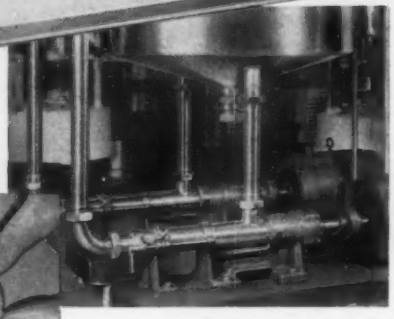
ESSENTIAL OILS · AROMATIC CHEMICALS · PERFUME BASES
FLAVOR BASES · DRY SOLUBLE SEASONINGS

*Quick cleaning*

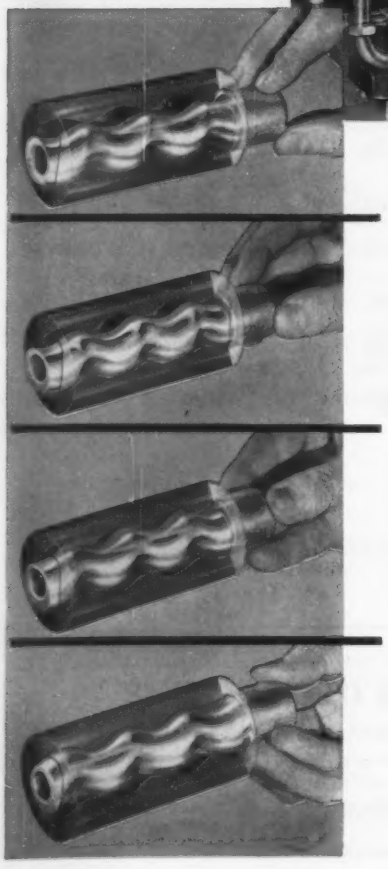
# MOYNO® FOOD PUMP

## cuts costs and speeds processing!





**"Progressing cavity" principle . . . pumps everything from hamburger to potato salad!**



With simply-designed Moynos pumping your food products, workers formerly assigned to long, costly pump cleanups can be used for other tasks! The entire Moyno unit can be quickly dismantled for thorough, effective cleaning and re-assembled in minutes. Moynos are more sanitary on the job, too. Pumping element has smooth contours which can't lodge particles where bacteria might thrive. Bearings are isolated from pumping compartment to prevent contamination by lubricant.

Moynos operate on the "progressing cavity" principle, illustrated at left. The screw-like, reversible rotor revolves in a double threaded stator, creating the progressing cavities. Material moves smoothly along, without pulsation, aeration, agitation, disintegration or contamination! All wettable parts, except stator, are stainless steel. Stator may be stainless steel, synthetic rubber, odorless bakelite or other material—depending on service. Any food product that will move through a pipe can be pumped with a Moyno—even lumpy ones like fruit cake mix!

*Learn more about Moyno—the quick-to-clean pump that food can't stump. Write today for Bulletin 30-FE!*

**ROBBINS & MYERS, INC.**

SPRINGFIELD, OHIO / BRANTFORD, ONTARIO

R&M®

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isn't any need for concern in application of the principles of automation. Not if proper and thorough explorations are made in advance. At least that has been my experience with automation.—*Wesby R. Parker, President, Dr. Pepper Co., Dallas.*

## Controlling Starlings

*Question—We are up against a problem—starlings creating noise and defacing our buildings with their excrements. Have you any workable suggestions?*

Answer—First thing you should do before making any attempts to control starlings is to make sure you don't violate state or local regulations.

And then you must consider the public relations aspects. For it's usually those not affected by these birds who might oppose any control program you might propose.

It would then be to your advantage to learn about the roosting behavior of starlings. Briefly, they scatter to rural and suburban areas during the spring nesting seasons. They roost generally in trees throughout the summer, and shift their roosts to city buildings for the winter months. Then they leave their roosts about sunrise, fly in flocks a distance of about 50 miles, and return at dusk.

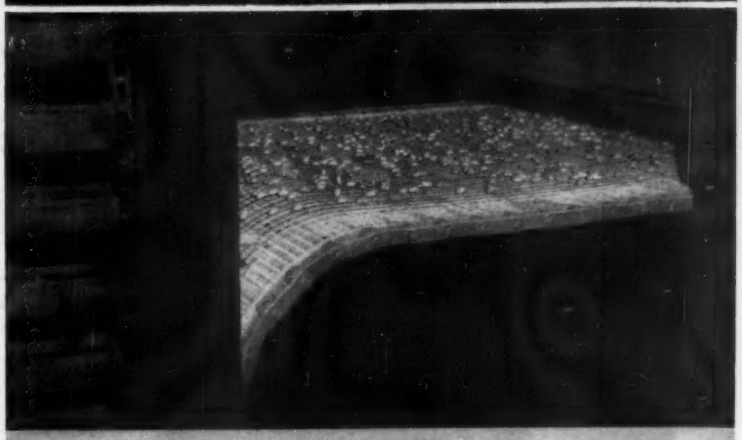
As for control methods. Earlier attempts to frighten starlings employed a variable-frequency oscillator.

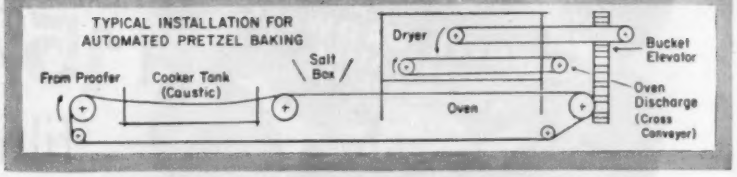
Recently, tapes or records of the sound of starlings in distress have been played back through amplifiers and directed through loudspeakers toward roosting areas. However, use of such distress calls has met with limited success. And the public relations aspects must not be ignored.

You might check possible use of wire "porcupines" (flexible bars bearing many pointed wires of different length) to prevent starlings from gaining suitable resting areas, or chemical repellants of an adhesive nature. These adhesive materials have been reported successful in many cases, particularly with pigeons. They're applied in large amounts from caulking guns—two or three bands to wide areas.

Electric wiring, similar to stock fencing, might be investigated. Wires carry low-voltage current that gives a mild shock.


Cambridge WIRE MESH BELTS






**METAL-MESH BELT CONTROLS PRODUCT UNIFORMITY IN CONTINUOUS BAKING**

Every day, millions of tiny pretzels pour from Cambridge Wire Mesh belts onto packing tables—each as uniformly baked and tasty as the next because oven heat flows *through* the belt and around the product. And, clean, sanitary Cambridge Belts can't destroy flavor or contaminate foods because they can't rust, rot or absorb odors.

*In other food operations, too,* such as washing, freezing or packaging, Cambridge Belts help increase production and cut operating costs. Here's how:

**CONTINUOUSLY MOVING BELTS ELIMINATE BATCH PROCESSING**—give faster, more economical processing; reduce slow, costly manual handling.

**OPEN MESH PROVIDES FREE AIR, LIQUID CIRCULATION**—foods are baked, blanched or frozen quicker; wash solutions, dirt and grit drain through belt in a flash.

**ALL-METAL CONSTRUCTION IS HEATPROOF, COLDPROOF, RUSTPROOF**—Cambridge belts can be woven from any metal or alloy to take up to 2100° F. or sub-zero temperatures.

**SPECIAL SURFACE ATTACHMENTS AVAILABLE**—raised edges or cross flights hold product on belt during movement.

**Talk to your Cambridge Field Engineer soon—he'll explain the many advantages of continuous food processing on Cambridge Wire Mesh belts. He'll recommend the belt size, mesh or weave—and the metal or alloy—best suited to your operations. You'll find his name in the classified phone book under "BELTING, MECHANICAL". Or, write for FREE 130-PAGE REFERENCE MANUAL giving mesh specifications, design information and metallurgical data.**

**The Cambridge Wire Cloth Co.**

WIRE CLOTH | METAL-MESH CONVEYOR BELTS | WIRE CLOTH FABRICATIONS

Department Q, Cambridge 11, Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

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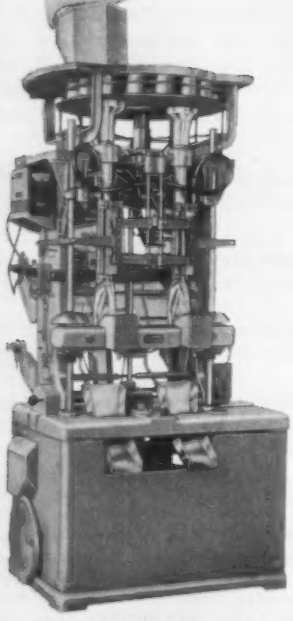
# this polyethylene package is made with 15% LESS film!



## STOKESWRAP "impulse seal" eliminates tabs, cuts film costs

Every seventh package at no cost! That, in effect, is what Pioneer Growers Cooperative of Belle Glade, Florida, has achieved with STOKESWRAP "impulse sealing" to package its famous brand of radishes.

With conventional sealing methods, each package required an additional inch of film in the form of tabs or ears. With STOKESWRAP impulse sealing, however, the package is cut off at the seal, eliminating the tabs and saving up to 15% in film length required. Electric eye control assures positive registration of the printed web. Positive sealing and cutoff are completed quickly in one automatic operation at high speed. The web is held in constant tension with no reversing, for smooth trouble-free operation.

"Due to the nature of this sealing and cut-off device, we can safely say we are saving nearly 15% in film," reports Mr. F. C. Dooley of Pioneer Growers.

Made from 1.25 mil polyethylene web 11⅛" wide, the 8-ounce package above measures 5¼" x 7¾". Elimination of conventional ears saves 1-inch of film length per package. STOKESWRAP with its wide selection of feeds – pocket, auger, tablet counting, net-weight scale and special mechanisms – is ideally suited to polyethylene packaging a great variety of products.

*For complete details on how "impulse sealing" can cut your packaging costs, write to:*

fmc
FOOD MACHINERY AND CHEMICAL CORPORATION

*Putting Ideas to Work*

**FOOD MACHINERY AND CHEMICAL CORPORATION**
**FMC Packaging Machinery Division**

**Stokes & Smith Plant**
**4914 SUMMERDALE AVENUE, PHILADELPHIA 24, PA.**

# Take a Tip from Heinz—Market Your Progress

"We take you to the Nation's capital—to the office of Vice-President Richard M. Nixon."

With that comment from Dave Garroway, thousands of important food store operators see and hear the Vice-President on closed-circuit TV as guests of H. J. Heinz Co. These key customers are assembled in large hotel dining rooms in 29 cities of the U.S., Canada, and other countries.

They listen attentively as Mr. Nixon recounts his experience with the "57" Varieties in his family's grocery store. These items moved off the shelves so fast that he came to know them well.

Then the Vice-President praised the role played by American foods in building international goodwill. Heinz baby foods, for example, improve the health of youngsters in Malaya. In turn, the economy of that country is bolstered by the sale of spices for American food products.

**Prime Minister participates in program**

"Now we go to Australia, and here is Prime Minister Menzies."

Impressive, and sincere, the dignitary from down-under recalls a chance meeting a few years ago with a bright young American business man. This gentleman asked many questions about food business opportunities in Australia. The man turned out to be H. J. Heinz II, who subsequently built in Australia one of the finest food plants in the world.

Such tributes from big figures in two governments are most impressive. Yet these are but a small part of the total drama in the 60-min. telecast that followed cocktails and dinner.

Lets start at the beginning. We see Garroway on the corner of Heinz and Progress Sts., Pittsburgh. The camera swings up and there—its glass walls blazing with light in the darkness—is the new Research Center. A tour through the fine offices, labs, and pilot plant follows. This is dramatized by significant statements by key personnel. As they act their roles, the part played by advanced food science and quality control at Heinz is strikingly evident.

A highlight is a scene in which Mr. Heinz and other executives are working as a taste panel. "What are you tasting?" inquires Garroway. "Ketchup packed in 1939", says Mr. Heinz, "and it's still good."

The TV story takes the audience to tomato fields in the fertile San Joaquin Valley. These supply the Heinz Tracy plant. Here, raw material quality is emphasized, along with Tracy's benefits to farmers.

Heinz customers and friends are "taken" to Canada for facts about the fast-growing business there. To England they go for such sights as a Royal Coat of Arms emblazoned on the Heinz factory. It supplies products to Her Majesty the Queen.

Heinz is shown in operation in China and Malaya, too. Truly it is a fascinating world-wide telecast.

**Broad sweep and terrific impact**

It ranges through 89 years of Heinz history and all phases of the business. The house is shown in which the founder packed the product that started it all—PURE horseradish in glass. And there is a timely 1958 product announcement—new concentrated tomato juice.

This telecast tells a terrific story of outstanding achievement. It promises even more surprising advances to come.

Take a tip from Heinz. Turn technical achievement into a highly effective marketing effort.

**1.** Merck is your new basic source of supply for MSG. Recently completed Merck production facilities with multimillion pound MSG capacity can satisfy even the healthiest appetite for this important flavor-enhancing ingredient.

**2.** You can depend on Merck for unlimited quantities of MSG because the unique and technically advanced fermentation process utilizes raw materials which are available in unlimited supply. No other Merck product or process competes for this supply.

**3.** Like all Merck food processing ingredients, the quality of Merck MSG is unsurpassed. It meets the highest quality-control standards for monosodium glutamate 99+% pure.

**4.** Merck MSG is available in two forms—Crystals and Fine Crystals—to fit your requirements. It is packaged in 100-lb., 50-lb., and 10-lb. containers.

**5.** Merck MSG deliveries are fast, since distribution centers are strategically located from coast to coast.

**6.** The Merck Food Research and Technical Laboratories are fully staffed and ready to serve you. Technical assistance, including MSG assay service, is available on request.

**7.** Ask your Merck representative for complete information about Merck MSG or write directly to:

MERCK & CO., INC.
RAHWAY, NEW JERSEY

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# OLIN PACKAGING PRODUCTION NEWS

OLIN CELLOPHANE PUTS PRODUCTS IN MOTION—SPEEDS PRODUCTION, SPEEDS PHYSICAL DISTRIBUTION, SPEEDS SALES • VOL. 2, NO. 3


## ECONOMICAL HIGH SPEED OVERWRAP MACHINES FOR SMALL ITEMS

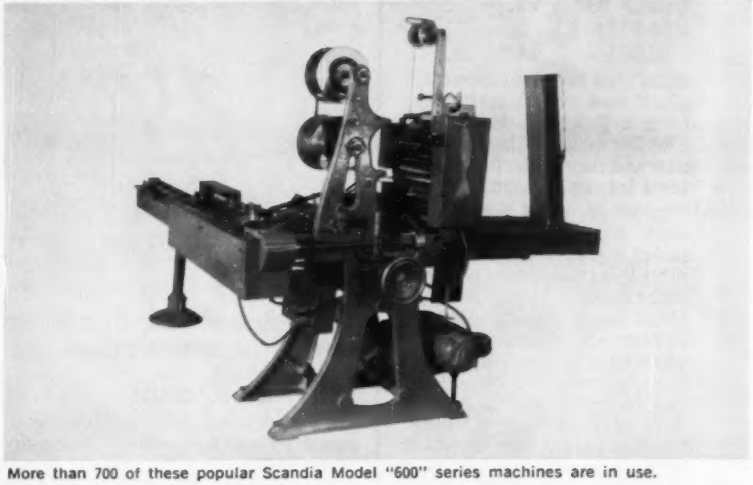
### CAPITAL INVESTMENT

Prices range from $7000-$15,000 for the standard types of overwrapping machines. Such an expenditure requires careful consideration. The needs of a packaging operation must be carefully analyzed and checked against the characteristics of the machine. Because long-term business and packaging trends indicate such machines will hold an ever more important place in the minds and careers of packaging men, this issue of the Olin Packaging Production News begins a two-part review of this particular type of machine.

### SCANDIA MODEL "600" SERIES

Machines made by the Scandia Packaging Machinery Company can be found in over 1000 companies both here and abroad. Of particular interest to this article is the Scandia "600" series (previous designation SFF-6)—the "work horse" of the Scandia line. This high speed overwrapper attains speeds of up to 250 a minute; small packages at the rate of 150 to 250 a minute, large packages, 75 to 150 per minute. Feed is from Hopper or Magazine, Lug or Automatic Intake Conveyor. Discharge is through a horizontal or vertical type stacker. The Scandia "600" is easily adjusted for varying package sizes. Web widths for the "600" series range from a minimum of 2½" to a maximum of 14½". Cutoff lengths may vary from a minimum of 5" to a maximum of 19". Extra attachments this machine may be equipped with are: tear tape applicator, code dating and stamping devices and automatic imprinters. The unique feature of the Scandia machines is that they make a "cigarette fold." This means that all the seals are made on the ends and sides of the package. Any overlaps on the facing panels of the package are naturally avoided. Over 700 of this type of Scandia machine have been sold.

Scandia is located at 500 Belleville Turnpike, North Arlington, New Jersey.



More than 700 of these popular Scandia Model "600" series machines are in use.

### PACKAGE MACHINERY CO. SERIES "F"

The Package Machinery Company of Springfield, Massachusetts needs no introduction to experienced packaging men. Several of their machines should be considered, the Model FF, FF-H, and the FA. The FA-2 and FA-4 share many of the same characteristics, but are designed for larger packages.

Package Series F machines are tailored to the requirements of the user. The FF was designed especially for the frozen food field and wraps at the cost-cutting speed of from 40 to 100 packages a minute. In the FF-H, the Package Machinery Company has developed a faster, but more specialized machine. It wraps standard size frozen food cartons at a rate of 160 a minute. Size range is limited as follows: Length, 5"—5 5/10", Width 4"—4½", Thickness, 1⅜"—1⅞". Measures have been taken to prevent slipping in feeding the wrapping material. The automatic horizontal carton feeder and the machine proper are one integral unit.

A less specialized machine is the "Package" Model FA. The Model FA will wrap goods in open boats, flat objects with or without a card, as well as products in cartons. It applies top labels and end seal labels if desired. You can wrap loose objects as well as regular packages. In spite of its adaptability, and ability to accommodate a wide range of sizes (minimum length 2", maximum length 11½"), the FA has

*(Continued on Page 2, Col. 2)*

## CELLOPHANE FILM DESIGNATIONS

Most cellophane reference terms aren't hard to understand at all, but a few old ones have pretty much lost their original meanings.

A good case of this is our "300," "450" and "600" gauge designations. The numbers originally meant that a square meter of a particular cellophane weighed either 300, 450 or 600 decigrams (tenths of a gram), but in recent years the term 300 has been used, in a broader sense, to refer to various light-gauge cellophanes which range in thickness between .0009" and .0010". 450 gauge no longer means a film weighing 450 decigrams per square meter—it's used for heavier grades of cellophane about .0014" thick. Heaviest of all are the 600 gauge films, making around .0017"; these aren't too commonly used in packaging.

Let's go on, now, to those cryptic letters we use. They *do* have a very real meaning—they tell us quite a bit about the protective and other physical properties of the particular cellophane. It'll help if we take an example and de-code it; in this case we'll pick a cellophane widely used for carton wrapping work:

**300 MST-54**

We know from the "300" that this film must be between .0009" and .001" thick—this one just happens to be .001". But, how about the letters? The first letter, "M," stands for "moistureproof," the "S" means "heat-sealable," and the "T" simply means "transparent."

*(Continued on Page 3, Col. 1)*



*(Advertisement)*

**OLIN PACKAGING PRODUCTION NEWS**

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Editor-in-Chief .....Joseph C. Mertes
Film Editor ..... Andrew W. Crawford, Jr.

## GLUED BAGS VS. HEAT-SEALED CELLOPHANE BAGS

What's the difference between a glued and a heat-sealed bag from a practical standpoint? This is a question that crops up now and then in the field; it has some interesting aspects.

First of all, glued bags can be made a lot faster than heat-sealed bags, and for this reason most large converters prefer to make this type of bag. Also, the glued bag is usually neater in appearance. Third, standard glued bags can be produced in a wider range of types; bags can be made with square-cut lips, or with "easy-opening" lips. The only serious drawback to this type of bag is that most glued bags cannot be made absolutely airtight. In some cases, this is helpful, as the filled bags can be "flattened out" after filling so that they take up less space in the shipping carton.

Heat-sealed cellophane bags, on the other hand, are almost invariably airtight; one of the favorite tests is to blow them up and pop them! But since it's sometimes necessary—as in the case of a double-wall gusseted foldover-bottom bag—to seal-through as many as sixteen plies of film, the sealing operation isn't as fast. Too, the high heat needed to make adequate seals in a hurry tends to distort or pucker the cellophane near the seal area a bit. This puckering is scarcely detectable, however, when the average type of bag is made on a properly adjusted heat-seal bag machine.

Unless your product absolutely requires an airtight bag, either type of construction should give you a most acceptable package.

OLIN MATHIESON CHEMICAL CORPORATION
Olin CELLOPHANE

"OLIN CELLOPHANE" IS A REGISTERED TRADEMARK

Package Machinery Co. Series "F" machines have a well-earned reputation.

*(Continued from Page 1)*

speed—up to 100 packages a minute.

## AUTOMATIC MODEL FW-35 BATTLE CREEK WRAPPING MACHINE

The "continuous flow" machines produced by the Battle Creek Wrapping Machine Company, Battlecreek, Michigan, are justifiably famous. Model FW-35 combines low initial cost with simplicity, versatility, and speed—approximately 100 packages a minute. Model FW-35 is so automatic an attendant is not required. Open trays as well as cartons can be handled, and the complete changeover from one size to another can be made in 10 to 15 minutes. An "electric eye" to register printed designs is optional.

## HUDSON-SHARP CAMPBELL WRAPPER

Made by the Hudson-Sharp Machine Company of Green Bay, Wisconsin, the Campbell Wrapper differs from machines previously discussed in that it produces a crimp seal fold. It can also form a glue or heat seal. Some might describe it as a quasi form, fill and seal machine. The speed of the Campbell Wrapper is very high—up to 300 a minute. It has proved itself a special favorite in the baked goods and candy fields since it "float" wraps products of any shape, regular or irregular. This type of wrapping eliminates double wraps, overwraps, boards or stiffeners. Essentially, the Campbell Wrapper forms a "tube" around the product from the packaging material, then simultaneously crimps, cuts, heat or glue seals, folds and discharges. A very popular typical Campbell Wrapper is the Model 2W-6.

## LYNCH MODEL 5—PB RS AND RA

Produced by the Lynch Corporation of Anderson, Indiana, these machines are in frequent demand where the problem is one of packaging loose units. The most versatile is the Lynch Wrap-O-Matic Model PB which can package a variety of products, ranging from automatic electrical points to labels, at rates of up to 125 packages per minute. Optional equipment includes a variety of product feeders, straight or right angle intakes, card and boat forms, inner liner application and automatic wrap registration control.

## LYNCH WRAP-O-MATIC MODEL RA

This side-intake machine was developed to meet the needs of confectionery, bakery and other industries for wrapping fragile or irregular-shaped as well as standard products. Similarly, the new Lynch Model RA Wrap-O-Matic was developed to meet the needs of those who wrap round or square cookie or cracker sandwiches, plain cookies, crackers or other items of similar nature.

### SPECIFICATIONS

**SCANDIA "600" SERIES**

**Weight:** 800 lbs. net
**Dimensions:** Floor area 52" x 56". Table height 31". Overall height 60".
**Speed:** Small packages—150 to 250 per minute. Large packages—75 to 150 per minute.
**Electric Equipment:** ⅓ h.p. motor. Heat seals—600 to 800 watts.
**Attachments: Feed:** Hopper or Magazine, Lug or Automatic Type Intake Conveyer.
**Discharge:** Horizontal or Vertical Stacker direction—Changer and Standard
**Registration:** Electric-Eye Unit (automatic) and Mechanical Type unit (manual).
**Paper Cut-Out:** Solenoid-Type (automatic) and Mechanical Type unit (manual).
**Opening-Tape:** Projecting Pull-Tab Type
**Drive:** Variable-Speed Motor
**Adhesive Applicators:** Solvent, Glue, Wax, etc.
**Heat Sealers:** Solenoid-Type (automatic) and Mechanical-Type (manual)
**Wrapping Material Size:** Max. web width—14½" Min. web width—2½"
**Material:** Cellophane or other flexible packaging materials.

**BATTLE CREEK MODEL FW-35**

| | Width | Length | Height |
|---|---|---|---|
| **Package Range:** | Max. 5" | 10" | 2½" |
| | Min. 1½" | 2" | ¾" |
| **Speed:** | 40 to 100 or more per minute | | |
| **Operators:** | 1—Completely automatic if fed from a previous packing conveyer. | | |
| **Floor Space:** | 5' long x 5½' wide. (8' long x 5' wide with extended discharge — optional) | | |
| **Weight:** | About 2000 pounds (crated) | | |
| **Material:** | Cellophane (MST) in roll form on 3" cores, not to exceed 14" in dia. and other flexible packaging materials. | | |

**OLIN CELLOPHANE PUTS PRODUCTS IN MOTION**

## CELLOPHANE FILM DESIGNATIONS

*(Continued from Page 1)*

The final numbers are simply numbers within a family group of films—for example, all of the "MST family" have the same degree of moistureproofness and have the same coating on them, even though the films themselves differ pretty drastically in their uses from one number to the next: in the MST family, -54 is quite different from -53 or -52 or -58 or -51, just as in your family you all have the same parents but are quite different from your sisters or brothers in your tastes, and in the work you do. How about this one—300 LSAT? Again, the number is simple. The "L," here, means "less moistureproof," or a lesser degree of moistureproofness than the M films have. S, again, means heat-sealable. The A stands for "anchored;" the coating of this film is firmly locked to the basic cellophane sheet so it won't let loose under extremely wet or humid conditions. T, again, is for transparent. So we've got a transparent, light gauge film which gives some moistureproofness—but not too much—and a coating that'll heat seal and will stay sealed even when soaking wet.

Here are the code letters Olin uses; our competitors' letter codes differ a bit, but are roughly similar in principle:

M = moistureproof
L = partially moistureproof
P = plain (not moisture-protective)
S = heat-sealable
C = colored
T = transparent
A = anchored; coating locked to base sheet
OF = an exclusive Olin development
OX = polymer-coated film; such films have specially high protective properties and are the "aristocrats" of the cellophane business.

*(Advertisement)*

## SPECIAL HOLIDAY PACKAGING — YES OR NO

The first question, of course, is whether it is worth your while to use special holiday packaging at all. The answer, within limits, seems to be, "yes"! True, the cosmetic and liquor firms were the first to use holiday packaging on a large scale. But since then the idea has spread rapidly. That jewelry, tobacco, stationery, confectionery and household textile firms are aware of it is indicated by the many announcements of new gift packages; at least one a year and, in many cases, for each seasonal promotion. "Something new" has universal appeal in every field.

Another factor to consider is that gift packaging gives a product standout appeal. Packages in ordinary dress during holiday periods may well be passed by in favor of something more visually exciting in an entirely different line. Again, retailers like items that create enthusiasm among salespeople and customers. A sound holiday package can do it.

### TEST OF SOUND GIFT PACKAGING

The elements of guesswork are difficult, but there are certain guideposts which should be followed.

The gift packaging should be equal to or superior to competitors.

It should be able to stand up to in-store handling.

The price of the packaged item must be in line with current consumer preferences.

Avoid bulk. An unnecessarily bulky package indicates bad planning. Every inch of retail space must produce a set volume of sales results.

Self-service selling requires maximum display potential. Don't plan a closed, sealed package for an item which customers want to handle, or that a dealer wants to show in open display.

### PRE-TESTING THE HOLIDAY PACKAGE

It is difficult, especially for small and medium sized firms to pre-test their holiday packages. Many firms therefore rely on the reaction of their salesmen because of their extensive face-to-face contact with wholesalers, retailers and jobbers. A manufacturer is usually guided by a combination of educated guesswork and past experience, plus an unshakable determination to avoid the undesirable characteristics listed above.

### SOME EXCELLENT SOLUTIONS

If a manufacturer uses a film overwrap, an easy solution is possible. During holidays the film may be printed with appropriate seasonal designs. Even daily-use items such as cellophane wrapped bread can profit from this festive note. Another admirable compromise solution is the use of seasonal or holiday printed cellophane bands that dress up items for special occasions. These, used on or over standard daily use packaging, serve to dress up the item, but can be removed by the retailer after the holiday without injuring the standard package. Such bands are often used on hosiery, chocolate, liquor and other packages.

**CAMPBELL WRAPPER 2W-6**

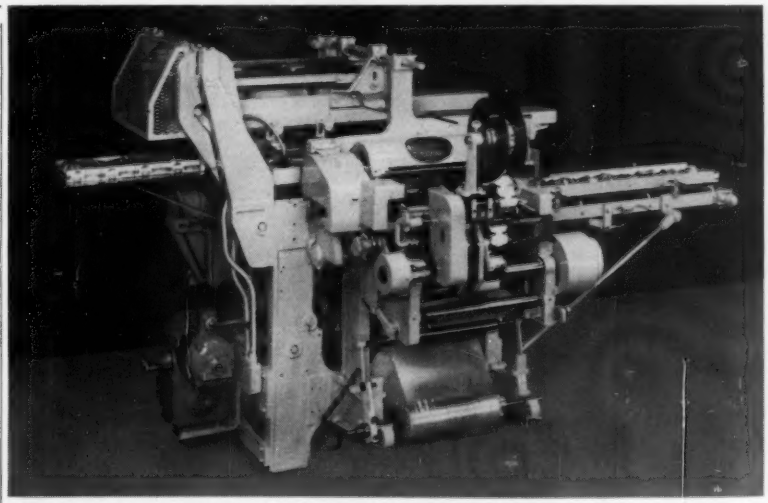
| | |
|---|---|
| **Package Range:** | Tubes up to 1⅛" diameter<br>Tubes up to 8" in length |
| **Speed:** | Variable to 300 per minute |
| **Operators:** | 1 |
| **Floor Space:** | Approx. 8' x 3' |
| **Material:** | Cellophane in roll form on 3" cores and other flexible packaging materials. |

**PACKAGE MACHINERY CO. MODELS FF, FF-H, FA**

| Model FF | Length | Width | Thickness |
|---|---|---|---|
| **Package Range:** | Max. 11"<br>Min. 3½" | 5⅜"<br>1¾" | 3"<br>1" |
| **Speed:** | 40 to 100 per min. | | |
| **Drive:** | ¾ h.p. | | |
| **Operators:** | 2 | | |
| **Floor Space:** | 12' 10" 6' | | |
| **Net Weight:** | 2,800 lbs. | | |
| **Material:** | Cellophane, high-gloss waxed paper, etc. | | |

| Model FF-H | Length | Width | Thickness |
|---|---|---|---|
| **Package Range:** | Max.5 5/16"<br>Min.5" | 4¼"<br>4" | 1⅞"<br>1⅜" |
| **Speed:** | 160 | | |
| **Drive:** | 1 h.p. | | |
| **Operators:** | 1 | | |
| **Floor Space:** | 196" x 76" | | |
| **Net Weight:** | 2,860 lbs. | | |
| **Material:** | Cellophane, high-gloss waxed paper, etc. | | |

| Model FA | Length | Width | Height |
|---|---|---|---|
| **Package Range:** | Max.11½"<br>Min.2" | 5⅝"<br>1⅛" | 3½"<br>⅜" |
| **Speed:** | 40 to 100 | | |
| **Drive:** | ¾ h.p. | | |
| **Operators:** | 2 | | |
| **Floor Space:** | 10' x 5' | | |
| **Net Weight:** | 1,475 lbs. | | |
| **Material:** | Cellophane, high-gloss waxed paper, etc. | | |



Model FW-35C made by Battle Creek Packaging Machines, Inc., equipped with label feeder, imprinter, self-clearing overhead carriers and variable speed drive.

**LYNCH MODELS PB, RS, RA**

| | PB | | | RS | | | RA | | |
|---|---|---|---|---|---|---|---|---|---|
| | Length | Width | Height | Length | Width | Height | Length | Width | Height |
| **Package Range:** | Max. 7½"<br>Min. 1⅜" | 4⅞"<br>11/16" | 1⅜"<br>⅛" | 1¼" to 2" diameter square or any combination and length in this range. 1½" to 3" in length. | | | 7½"<br>1⅜" | 4⅞"<br>11/16" | 1¾"<br>⅛" |
| **Speed:** | Up to 125 per min. | | | Up to 100 per min. | | | Up to 125 per min. | | |
| **Floor Space:** | 135" | 54" | 45" | 142" | 51" | 55" | 98" | 79" | 45" |
| **Weight:** | 2400 lbs. (crated) | | | | | | 2000 lbs. | | |
| **Material:** | Cellophane and other flexible packaging materials. | | | | | | | | |

**OLIN CELLOPHANE PUTS PRODUCTS IN MOTION**

SEE IT HERE

# PACKAGING EFFICIENCY AT LUDEN'S INCORPORATED

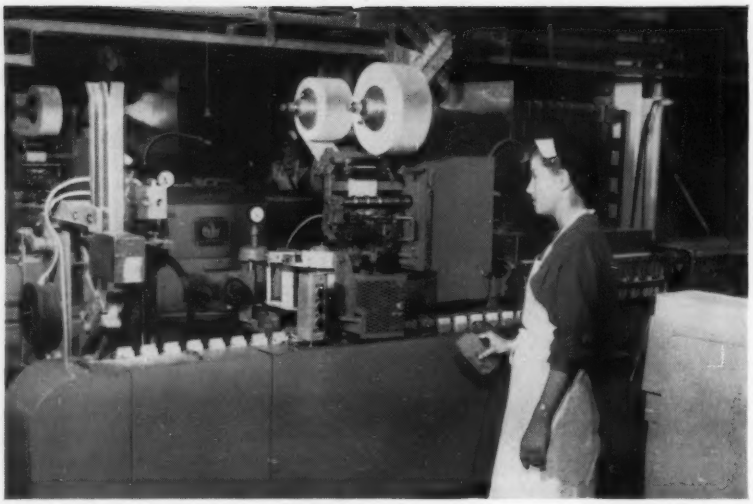
Luden's Incorporated, of Reading, Pennsylvania, has automated their packaging line with the result that 125 10¢ cough drop packages are produced per minute with only two operators.

First the girl inserts the knocked-down boxes into a gravity feed stack attached to a specially built Redington machine. Boxes are set-up, liners are inserted, and finally filled with cough drops on the first machine.

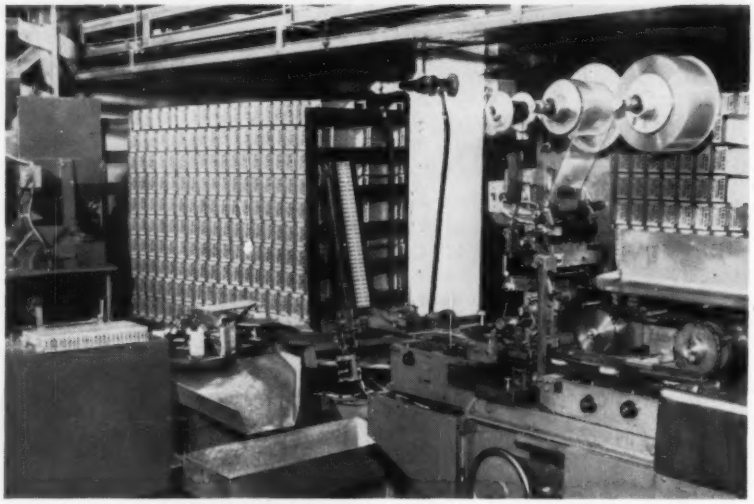
A conveyer then moves the cough drop boxes to a second Redington machine that overwraps the boxes with sparkling, moisture-proof cellophane.

Finally, the second operator fills a shelf-unit with twenty 10¢ packages. She then puts a sleeve around two "20's," and the cough drops are ready for the shipping carton.

Luden's offers an excellent example of the super-efficiency that can be achieved with today's automatic packaging equipment.



1. Boxes are set-up, liner inserted, and filled.



2. Filled boxes are carried to cellophane wrapping machine and overwrapped.

3. Operator fills shelf-unit with 20 packages, puts sleeve around two "20's".


Statements made herein as to the performance or characteristics of any machine or other product not of our manufacture are made on the best information we could obtain and should be checked with the appropriate manufacturer or distributer of the product involved. The Film Division of Olin Mathieson Chemical Corporation and the Olin Packaging Production News are neither recommending nor guaranteeing any machine or product reported, nor do they warrant or assume any obligation with respect to the performance or characteristics thereof.

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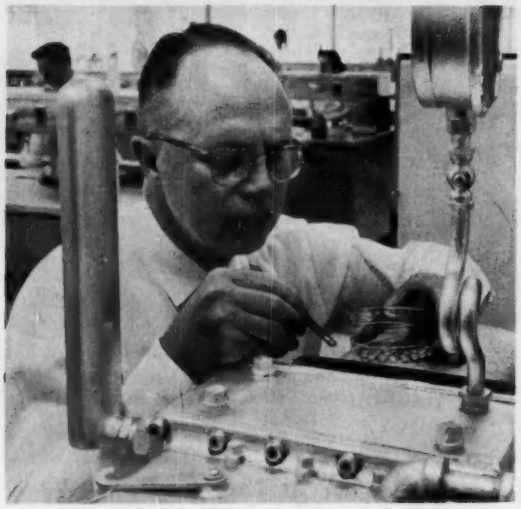
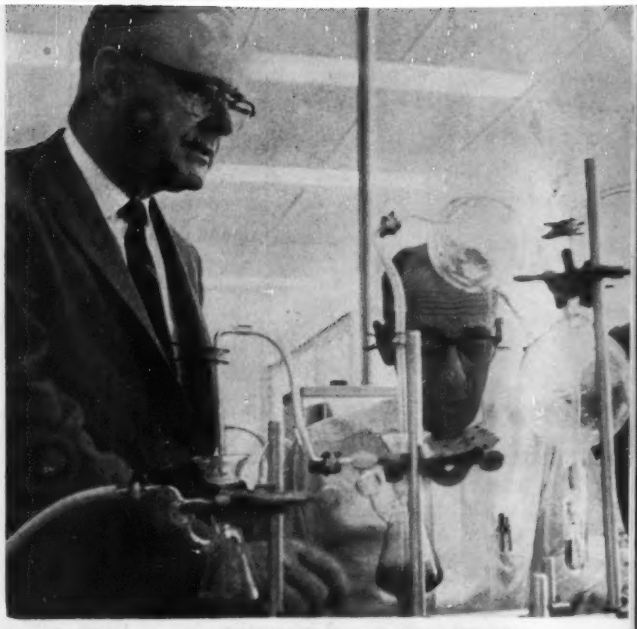


**THERMORESISTOMETER** determines heat-sterilizing conditions for optimum product quality, including color, flavor, nutritive value and texture. Inventor Charles R. Stumbo, head of nutritional and bacteriological research lab, makes test.



**VOLATILES** are quantitatively measured in technology lab by passing air through food sample and into potassium permanganate solution. I. J. Huchings (left), food research manager, and Robert E. Buck, head of food technology research lab, operate apparatus.

# New Heinz Lab Sparks Progress

**Implements development and quality control with seven research areas and big pilot plant —all housed in new glass-wall Research Center**

WHY DID H. J. HEINZ CO. invest heavily in a fine, new central research and quality control laboratory in Pittsburgh? What facilities does it make available? And what benefits are stemming from this monument of progress?

Management's answer to the first "why" comes from President H. J. Heinz II:

"Nearly a century ago, the founder of the House of Heinz formulated this personal philosophy:

'To do a common thing uncommonly well brings success.'

"However, he went beyond his own philosophy. In his time, the establishment of uncompromising standards of purity for the first of the 57 Varieties constituted the doing of a very uncommon thing. In fact, it was virtually a revolutionary idea.

**Special to FOOD ENGINEERING**

"Today, success in our field requires full attention to the scientific aspects of food preparation, with particular emphasis on nutritional values. It requires the best of facilities, the best in environment.

"The new Heinz Research Center represents not only our belief in the future, but our conviction that the making of quality foods is a public trust."

This philosophy is pinpointed by C. L. Rumberger, vice-president of research and quality control:

"The Heinz centralization of quality control, as exemplified by our new international Research Center, ties in with a very cardinal principle —uniformity of Heinz products.

"We have quality control managers at each of our plants. They check the ingredients and packaging before production. Then the quality of a factory's products is checked after production. And factory production gets a final check at the home office.

"This system assures that, whether a food product is manufactured at Pittsburgh, in California, England, Canada, Australia, or Holland, it has the uniformity guaranteed by Heinz."

As to facilities, there are no less than seven labs in the Research Center—chemical, microbiological, bacteriological, organoleptic, packaging and sterilization, nutrition, and food technology. In addition, there is an unusually well equipped pilot plant to simulate production under factory conditions.

The new building also houses the executive offices of Heinz International's organization.

Facing Progress Street and overlooking the Allegheny River at the rear, the eight-story glass and aluminum structure occupies 120,000 sq. ft. The site adjoins the general offices and manufacturing buildings which comprise the Heinz Pittsburgh plant group.

Now for a more specific look at

**CHEMICAL LAB** typifies excellent layout, lighting, and equipment provided in each of seven laboratories of Research Center. All labs have handy outlets for steam, distilled water, and compressed air.

**QUANTIFIER** in organoleptic lab measures product flow against time, to determine consistency. Lever and weight mechanism release product from cylinder for flow along metering trough.

unusual facilities and innovations in processing, packaging, and quality control:

The long-standing Heinz philosophy of semi- or fully automatic operations to replace manual control is reflected in the pilot plant, or engineering research laboratory. One of the largest and best equipped in the industry, it measures approximately 200 by 80 ft.

Its function is interpreted by Robert H. Stimpson, research engineering manager:

"In the old days, experimental chefs thought of food processing as an art. Today it can be broken down into engineering functions and mathematical calculations.

"Heinz is pioneering the closed continuous process system—at the same time retaining, through its experimental kitchens, the personal element still so necessary in developing recipes."

An improved vacuum evaporator is among the new pilot plant equipment. It is a 25-ft.-high, double-effect, stainless steel unit which will evaporate 5,000 lb. of water per hour.

Heinz also is pioneering an improvement in evaporator control. Working with Ohmart Co., the firm is developing a new type of density control, using radioactive energy. By means of cesium 137, a detector ray is shot through the concentrate.

In this way, density can be detected without having internal connections or continuously removing samples. This principle already is in use at the Heinz automatic ketchup factory at Bowling Green, Ohio. If further tests prove out, the nuclear density control will be applied to all Heinz installations.

Another piece of pioneering equipmen in the pilot plant is the continuous centrifuge. This 40-hp., continuous-discharge, jet-nozzle unit operates at 6,000 rpm. and develops 9,000 G's. Heinz is using it to separate thin tomato pulp into insoluble solids and (2) clear liquid. Purpose is to concentrate clear liquid and blend it with fibrous material which has not been concentrated. This prevents damage to the color of pigments in the fibrous material.

Five continuous cooking devices are installed in the pilot plant. Patents on these are pending in the U.S., and already have been issued in foreign countries to James B. Anderson, head of research engineering. The principle involves shooting raw materials through a jet with steam for instantaneous cooking. Baby foods are among the first treated in this fashion.

The Heinz pilot plant features a complete tomato-preparation line scaled to one-fifth manufacturing size for washing, sorting, scalding, and pulping tomatoes.

Other pilot plant units are:

**Finished goods stationary sterilizers:** Scaled to one-third manufacturing size for the final cooking and sterilizing in closed containers.

**Finished goods rotary sterilizer:** Used where agitation inside the container is desired for fast cooking and sterilizing. It simulates operations of large-size cookers.

**Fractional distillation column:** Responsible for concentration and flavor recovery.

**Filling lines:** Scaled to one-seventh of manufacturing lines and used for washing, filling, capping, and cooling glass or tin containers.

**Cooking kettles:** Ranging from 10 to 250-gal. capacity, these kettles make control batches conventionally, to simulate present operations prior to installation of continuous cookers.

**Drum dryer:** Used to dry baby food cereals and other products from liquid to flake form.

**Deaerators:** For removal of entrained air in products by flashing under a vacuum.

## Packaging and Sterilization

The new Heinz packaging and sterilization laboratory contains equipment for testing in three areas: (1) General packaging, including cans; (2) glass packaging; and (3) sterilization control.

In glass-testing equipment alone, the new Heinz lab has as much or more than the average glass manufacturer, according to Karl F. Lang, packaging lab director.

The recently introduced Heinz aluminum screw-top closure for baby foods—replacing the slip-on cap—is a development of the laboratory.

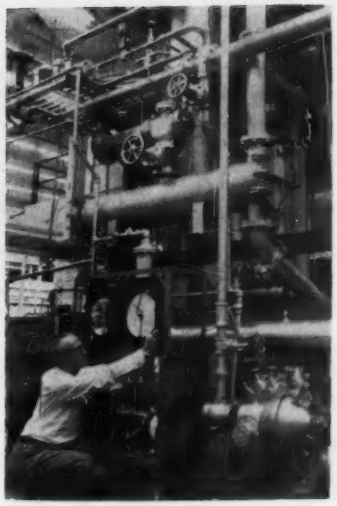
Heinz is test-marketing yellow mustard in both plastic tubes and squeeze bottles. The packaging lab recommended the type of polyethelyene to be used. Linear and high-density polyethylene were both ruled out, as being too rigid.

### Mechanizes Window Washing

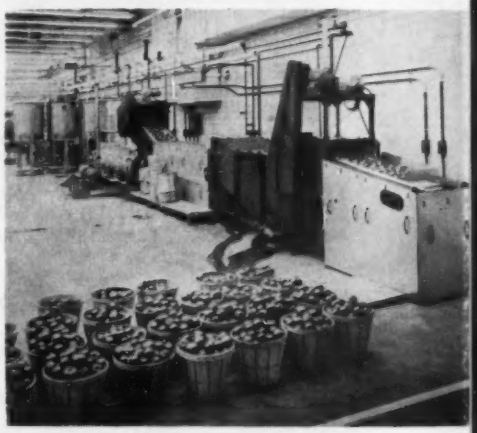
**Keeping the expansive exterior glass walls of the new Heinz Research Center clean could be costly. But an electrically operated scafford suspended from a track around the perimeter of the roof has been developed. A "cage" rides on four cables (two for safety) up, down and across, cleaning both glass and aluminum. It takes a week for monthly washing.**

**ADVANCED** facility in pilot plant is 6,000-rpm. continuous centrifuge for separating thin tomato pulp into fibrous material and clear liquid. Liquid is then concentrated and blended with solids, avoiding color damage.

**PACKAGING LAB** uses visual magnifying comparator to establish specifications for glass container contours and threads. Seen checking unit is Karl F. Lang, head of packaging and sterilization lab.



**PILOT PLANT** evaporator is continuous double-effect vacuum unit, one-sixth production size. Robert H. Stimpson, engineering research manager, adjusts controls.



**ONE-FIFTH SIZE** tomato processing line will permit production testing of new ideas without tying up busy, large-scale factory equipment, or using large quantity of material.

The packaging laboratory also gave advice on an aluminum-polyethylene pouch for individual servings of ketchup. First considered was a "polycel" envelope (lamination of polyethylene and cellophane). But this type of container had a limited shelf-life. It didn't hold up when filled with ketchup heated to 195 deg. Under the Heinz system, the pouches are given a hot fill, followed by cooling under controlled conditions. This makes preservatives unnecessary.

So, the packaging lab recommended a laminated ketchup pouch with glassine on the outside, aluminum foil in the middle, and polyethylene in the inside.

Introduced in August, this pouch already faces a change. To "brighten" the package with a smooth, silvery finish, cellophane will be substituted for the glassine coating.

Laboratory director Lang points out that the packaging field is constantly changing and represents "one of the most fertile" fields for economies in the food industry.

One of the prime projects of his lab is a search for a rigid plastic with all the good qualities of glass and none of glass's undesirable qualities, Mr. Lang reports. The savings could be huge, he comments.

Equipped for versatility, the packaging lab has these units:

**Polariscope:** It determines annealing properties of glass containers by color intensity.

**Preston hydrostatic tester:** Determines amount of internal pressure a glass container can withstand.

**Drop tester:** Checks strength of corrugated cases by dropping from varying heights.

**Glass-cutting saw:** Cuts cross-sections of bottles for inspection.

**Thermal-shock tester:** Determines ability of glass to withstand hot filling.

**Preston impact tester:** Hinged hammer measures striking velocity and inch-pounds of force on the glass.

**Visual comparator:** Magnifies contours of glass containers on a screen for visual inspection of angles, curves, and radii of threads.

**Tin testing equipment:** Superficial hardness tester, sheet-metal testing machine, can seam projector, and can-cutting saw.

**Humidity cabinets:** Test exposure of packaged foods to varying humidity levels for prescribed periods.

**Controlled temperature rooms:** Expose packaged foods to temperatures ranging from 40 to 110 deg. F.

**Potentiometer:** Records temperature of hot-lunch vending machines.

## Other Advanced Features

Walls of the Heinz laboratories and quality control areas are white structural-based tile. Floors are rubber tile. Ceilings are of glass fiber and acoustical plastic. The low facade of the building is of ceramic-glazed bricks, laid in the attractive diamond-patterned Flemish bond.

Air in the fireproof building is 100% electronically filtered. And the plate glass sides are gray-tinted to provide color-correct lighting.

In the laboratories, all kitchen equipment and bench tops are made of stainless steel. Every piece of equipment has been fitted snugly, leaving no small spaces in which dirt can accumulate.

The laboratories have convenient outlets for vacuum, steam, distilled water, and compressed air. —*End*

# Vital Tips From Court Rulings

CERTAINLY, you don't seek legal trouble.

But sometimes it's thrust upon you.

As the old saying goes, however, forewarned is forearmed. In short, by knowing how the legal ball tends to bounce in specific mishmashes arising in the food field, you can generally conduct your operations so as to avoid litigation.

Or in event you do become legally involved, you'll find your knowledge of similar cases a most pertinent aid in ameliorating your situation.

Here, then, we will brief six recent high court decisions that offer particular frames of reference for food operators. Court index designations of the specific cases are added in parenthesis at the ends of the items as guides for those who may desire to dig deeper.

## 1. Tell Shipper About Strike?

Of particular importance is this recent higher court decision:

If a common carrier is aware that necessary prompt delivery of merchandise is uncertain, then it can be held liable for damage or loss of goods caused by such consequent delay in delivery.

Specifically, in *Southern Pacific Co. v. Rothstein*, it was shown that the railway's officials knew that certain of their employees were on strike. And at this time, one Rothstein delivered a number of lots of lettuce, making up several carloads, to the railway for shipment. But due to a transport delay caused by the strike, some of the lettuce spoiled before it reached the consignee.

In subsequent litigation, the higher court refused to release the railway from liability for $1,554.75 damages to the shipper.

"In the absence of a special contract," it declared, "a common carrier is bound to transport goods with reasonable diligence, care, and dispatch, and it is liable for unexplained, unreasonable delay in such transport."

In this case, the court continued, the carrier "seeks to excuse the delay in transportation on the grounds of a work stoppage (the strike). However, it is the duty of the carrier to inform the shipper of any cause likely to delay transportation that is within its knowledge or within its fair and reasonable means of knowledge, and if it fails to do so, a delay in transport of the goods will not be excused."

The court emphasized that here the RR officials knew that a number of their workers were on strike and that others might also "go out," and so it was the legal responsibility of these officials to notify shippers of these facts. Failure to do so resulted in the railway being liable. (304 S.W., 2d, 383)

## 2. Paid—Negligent or Not?

Irrespective of whether an employee's on-the-job injury is actually the result of his own negligence, he

**LEO T. PARKER**

Attorney at Law, Cincinnati

## It Might Have Been Your Company

### —So How Would You Answer These Questions?

■ A valuable load of perishable food is lost through spoilage when it's delayed in shipment due to a strike. But the common carrier failed to mention this trouble when accepting the shipment . . . **Can damages be collected from the carrier?**

■ An employee dies in an accident at the plant. His personal negligence may have been the cause. In fact, there's no direct evidence it wasn't . . . **Must State Workmen's Compensation be paid in this case?**

■ Aiming to keep out "nuisances," a city ordinance declares that it's unlawful to erect and operate a slaughterhouse within the community limits . . . **Given a test case, would the court hold such an ordinance to be valid?**

■ A company signs a lease to use a piece of property for a plant operation —but then finds its activities stopped by a valid city zoning ordinance . . . **Would the court then declare the lease void?**

■ A man is running a food processing operation in an area of the state that's been ceded to the U.S. Further, he's signed a lease stating he'll comply with all state and municipal ordinances—but then the local authorities find him breaking their restrictions . . . **Does the court hold for or against him?**

■ Food spoils in a public warehouse, and the owner of the goods goes to court and wins full damages. However, the warehouseman appeals the case, pointing to a clause in his tariff schedule that limits his liability . . . **What does the higher court do—"rescue" the warehouseman, or confirm the lower court?**

***Now Check Accompanying Article for the Revealing Answers***

or his dependents are entitled, declared a recent high court, to remuneration under the State Workmen's Compensation Act.

We cite here *Tulsa Frozen Foods Co. v. Pendergraft*, wherein these details were brought out:

One Pendergraft was employed by the Tulsa company as a butcher and assistant store manager. On a late afternoon, he went to the rear of the premises to get a roll of wrapping paper.

When he had not returned after a considerable time, a fellow employee went back to investigate and found Pendergraft lying outside the storeroom unconscious, one foot on a ladder and the roll of wrapping paper lying near his hand.

It was then noted that blood was oozing from a wound in the back of his head. He died shortly thereafter at the hospital.

In litigation that followed, the higher court held that dependents of Pendergraft were entitled to receive compensation under the State Workmen's Compensation Act despite lack of direct evidence relative to Pendergraft's actions — i.e., whether they were negligent—at the time of his accident.

The court said: "The concrete floor on which the deceased was lying was slick and partially covered with beef tallow. However, reason for the fall is not a fact which must be established by medical evidence. It could be established by circumstantial evidence alone."

A claimant, the court then concluded, "is not restricted to direct evidence" in demonstrating his right to workmen's benefits. (317 Pac., 2d, 1115)

## 3. Must Nuisance be Proved?

A city may legitimately curb operation of a plant demonstrated to be a "nuisance." But it can't, generally speaking, employ a city ordinance to prevent operation of a food processing plant as a nuisance where it is not, in fact, specifically shown to be such.

To be noted is the case *Mayor & Council of Mount Airy. v. Sappington.* Here, the city in question had passed an ordinance making it unlawful for any company to erect, maintain, and operate a slaughterhouse within the corporate limits of the community.

The litigation arose when a company proposed to build and operate a plant for killing and processing livestock in connection with the running of a local locker refrigerator plant.

The higher court promptly held the city ordinance invalid, saying: "Whether a thing or condition is *prima facie* a nuisance is a matter of evidence."

In short, the plant couldn't be considered a nuisance *merely by identifying* the type of operation and without proof it was obnoxious. (73 Atl., 2d, 449)

## 4. Is This Lease Valid?

Let's suppose you've taken a lease on a specific piece of property—but then find, after signing, that a city ordinance validly prohibits use of the facility for the particular purpose you intended.

Will a court then cancel the lease for you? The answer—to judge by *Warshawsky v. American Automotive Products Co.*— is "No."

Here, the city authorities cited a zoning ordinance to stop operation by the leasing concern—and made it stick (no use of heavy machinery in the area in question). And in subsequent litigation, the higher court refused to grant that this voided the lease.

Decision was that the owner of the property hadn't violated any law by making the lease. Said the court: "The only basis upon which an illegal act could be charged to the lessor (property owner) would be the making of a lease prohibited by law—and no law prohibits a lease of premises for the purposes stated."

Thus, a property owner can make a valid and enforceable lease for certain uses of his premises, even though such uses may then clearly be forbidden by a specific municipal ordinance.

In short, the wrong step lies in the lessee's operation—not in the lessor's making of the lease. And the obligation of first learning the full circumstances lies with the party taking the lease. Thus, we spotlight this moral: Don't sign a lease until you know all the factors. (138 N.E., 2d, 817)

## 5. When Is Local Law 'Out'?

If you operate your food business in an area that is under jurisdiction of the United States—then you are not subject to local or regional ordinances.

This was recently emphasized when a higher court held that exclusive jurisdiction of the United States meant exactly that.

The testimony in the specific case —*Thiele v. City of Chicago*—revealed that a particular local area had been ceded to the United States by the State of Illinois. Then later, the City of Chicago passed an ordinance aimed at restricting uses of property in this area.

Furthermore, the operator of the food processing plant that figured in this litigation had signed a lease in which he agreed to comply with all ordinances in the state and municipality.

Nevertheless, the higher court declared that he was not subject to city, county, or state laws restricting uses of his property.

The court stated: "The dominant fact in this case is that exclusive jurisdiction over the area in question has been ceded by the State of Illinois to the United States." (145 N.E., 2d, 637)

## 6. Does Limiting Clause Hold?

There are many different aspects and angles to contracts written in connection with the storing and the shipping of food products. This means that these matters call for the sharp attention of food plant operators.

Constantly arising are questions concerned with the validity of clauses which seek to limit the liability of the warehouseman or the transportation company.

Particularly clarifying here is the higher court decision rendered in the recent case *Hischemoeller v. National Storage Co.* So we shall review it in detail:

The testimony identified National Storage Co. as a public warehouseman governed by the Food Warehouseman Act. The latter defines food warehousemen as public utilities, and it requires them to file with the Public Utilities Commission their various schedules of rates and charges covering their warehousing and storage services.

Thus, it was revealed that National's officially filed schedule covering its cold storage warehouse tariff was specially written to limit its liability to a maximum figure.

Specifically it stated that vegetables stored with National were not to be deemed to exceed $100 per ton in value—unless the person to whom the warehouse receipt was issuable declared that they were of greater value and such greater value was noted on the receipt by the warehouseman.

In this case, the owner of the

goods could pay a higher rate and receive full coverage.

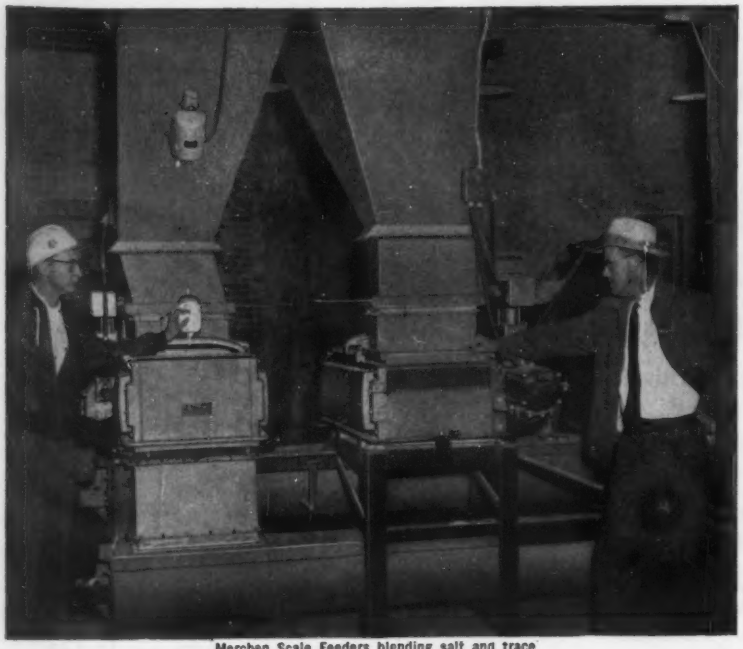
In the case in question, a large quantity of peppers were stored with the warehouse company without the owner declaring a value for them. Inspected every two or three months, these peppers appeared to be retaining their good condition. However, when finally withdrawn from storage they were moldy and damaged.

Subsequently, the owner sold them for $5,131.10—termed a loss of $23,112.30. He then sued the warehouse for the latter amount and won the decision.

But the warehouse company appealed to the higher court, which reversed the lower court, holding that the warehouse company was entitled to the benefit of its limitation provisions, bringing its liability down to $4,866.35.

The higher court clearly indicated that the owner of the peppers was bound by the schedules as filed with the PUC, including their stated limitations. In this respect the court declared:

"The rule is firmly established that, in absence of any sharp or unfair dealing on the part of the public utility (warehouse company), the terms and provisions of its tariffs, rules, and regulations . . . enter as implied terms into any contract . . . and absence of actual knowledge of those terms on the part of the customer is legally inconsequential." (284 Pac., 2d, 81—also same law is applicable to bills of lading, per *Fitch, Carpenter,* 161 Pac., 2d, 824. —*End*

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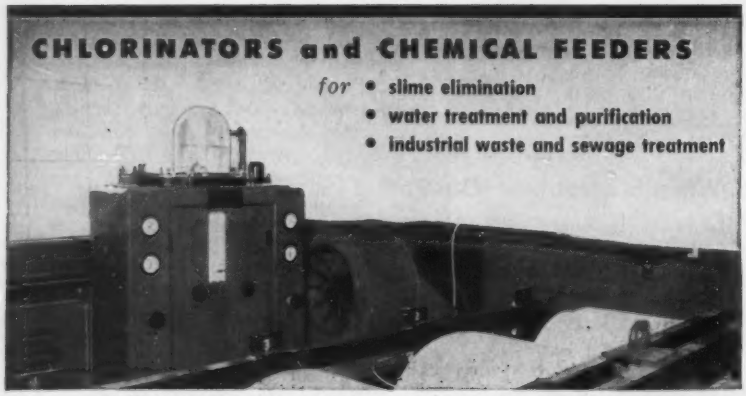

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**"Just be at ease, my good fellow—these things will happen, you know."**

**Ole Sage Episode**

# How Argue the Case for Modernizing?

"WASN'T SURE I'd make it here today," puffed Personnel Manager Milt Sorenson, last to arrive at the regular luncheon meeting of the Guff & Gripers. "At our place, for weeks," he explained, "it's been meetings, meetings—no end to the meetings. I just now broke away from one."

"Sounds like a whale of a lot of grievances at your company," needled Mull & Mull Co.'s works manager, Batt Bulwark. "When," he jibed, "are you going to stop mistreating those nice union boys at your plant?"

"Wrong as usual, Batt," parried Milt. "Our grievances—if any—must all have been settled this year by our foremen. None reached my department. And we've had no hassles with the union.

"Nope," he went on proudly, "our many meetings have concerned our modernization plans—and other ideas for the near future. Naturally, I sit in on the meetings, because proposed changes may affect some or all of our employees."

"I'm ag'in' wasting a fortune to modernize an old plant," bellowed Batt. But before he could continue, his fellow G&Ger's protested with cries of "Wait 'till after lunch!"

**Finally after coffee** was served, Ole Sage nodded to the obstreperous Mull & Mull works manager, and remarked: "So modernization gets your black ball, Batt?"

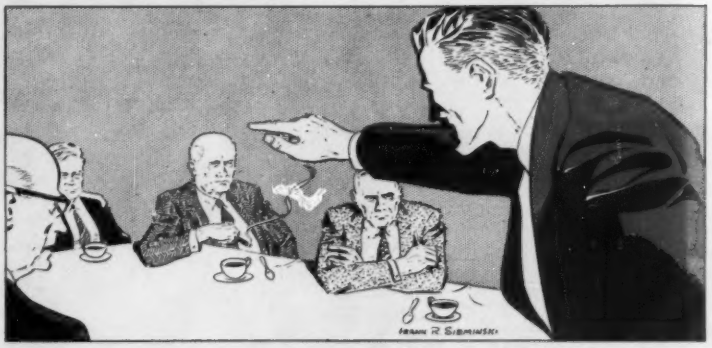
"Everyone's hollering," Batt barked, "that now's the time to modernize. For why?"

He glared around the table. "Aren't we doing' perfectly good with what we got? And aren't our sales generally moving up? Do you think that we in the food business should spend our profits? I don't fall for that kind of boloney!"

Zenith Canning Co.'s Ed Strong ventured: "Do you mean, Batt, that you don't think food companies would benefit from modernization?"

"What have they got to gain?" shot back Batt. "Even when unemployment reached its peak recently, food sales were still going up. I don't say that people with no jobs haven't had a rough time, but they've had *some* income, and they've been eating about the same as usual."

**IVAN C. MILLER**
"Food Engineering"



**". . . Live-wire competitors . . . with good products . . . and hard-to-meet prices," reeled off Milt. "Right there you have reason enough!"**

He pressed on: "Now suppose we in the food industry all go in for extensive modernization. When laid-off workers start getting their regular paychecks again, do you think they'll buy more food? Fat chance! They're already buying as much as they can eat. They'll spend for a deep-freeze, a TV, autos, furnishings."

Batt paused dramatically. "What's in it for us? Nothing that I can see. Our sales at Mull & Mull are 'way up this year—so all I say for modernization is let well enough alone!"

"You say your sales are 'way up, Batt," Milt probed. "How about your *profits*?" he asked pointedly.

Batt hesitated, then with an embarassed grin admitted: "Thin. But," he added defensively, "I suppose it's the same with the rest of you. How about profits with your company, Milt? Will you be able to squeeze out enough for your modernization—and still keep the owners happy, too?"

"It's because we have to keep the owners happy that we're planning modernization," Milt replied instantly. "You see, we learned something last year. We'd opened up an area that was too far away for us to supply economically from here. So we built a new up-to-date plant out there to cover the market. Well, profits of the new plant are gratifying—whereas profits at our place here are too close to red ink for comfort." He glanced toward Ole Sage, and said, "Likely, you can explain this better, Ole."

"You're doing just fine without me," Ole assured him. "Go on!"

Milt continued: "From the knowledge and experience gained at our new plant, we're certain the savings or lowered costs will amply justify the capital investment for main-plant modernization. Furthermore, we're convinced *now* is the time."

**"Why just now,** I'd like to know?" Batt growled.

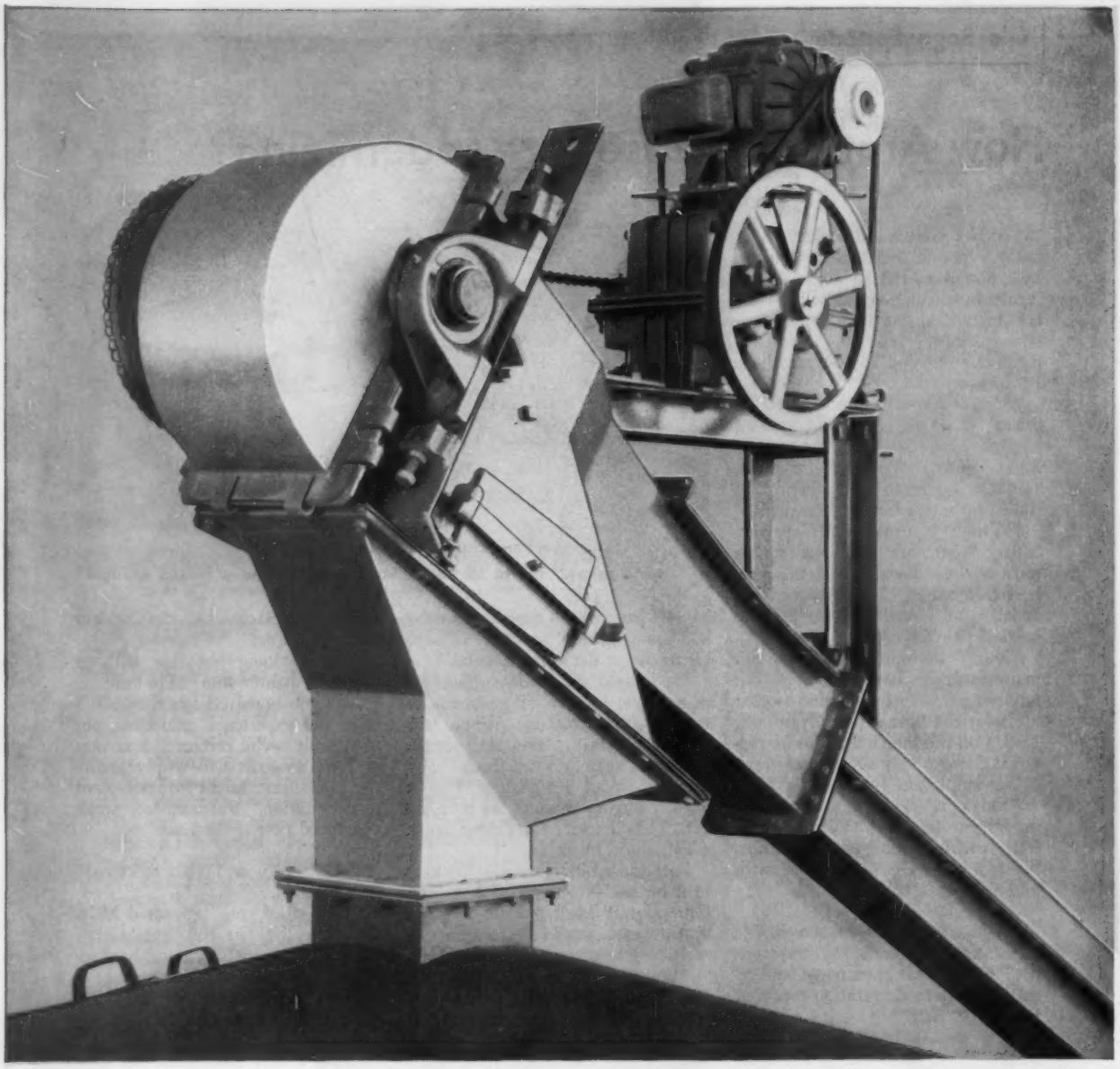
"Like all of you," answered Milt, "we have live-wire competitors . . . with good products . . . and hard-to-meet prices. Right there you have reason enough! But looking ahead, we also see equipment prices going higher in the future.

"And a very basic reason is that our plant here is old. Equipment bottlenecks on our lines mean that, under present conditions, it would only be at greatly increased product cost that we could step up our production to meet growing sales. We have to pay overtime for the extra production. We have to put on an additional shift at premium wage rates.

"But," he concluded, "that new out-of-town plant has now demonstrated how we'll gain by modernizing our plant here."

Batt tossed his cigar butt into an ash tray, pushed his chair back, and stood up. "As usual," he grumbled, "You've got me outnumbered!"

His rising signalled the break-up of the meeting. —*End*



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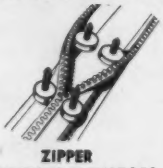
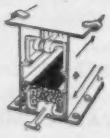


ZIPPER CONVEYOR-ELEVATORS

BIN GATES — ALL KINDS



REDLER CONVEYORS, ELEVATORS

# Put the squeeze on high bulk food handling costs with S-A ENGINEERED CONVEYING SYSTEMS

More consumer dollars are being spent on food now than ever before. The emphasis is on quality and convenient packaging which so often call for involved handling by food processors. Today the heat is on high food handling costs. Management is in quest of methods which will up production and at the same time preserve product quality standards.

The answer, of course, is in automation, and where can it be better applied than in your conveying methods? Squeezing down handling costs is the kind of pressure STEPHENS-ADAMSON engineers have been applying in the food processing field for years. Their sound, progressive designing has resulted in thousands of conveying systems to move a multitude of food products.

Closely allied to the S-A field engineering effort is a never-ending company research and product development program. It's part of over-all planning to provide the finest conveying machinery that can be devised. This equipment is "custom fitted" into engineered systems that pay fast returns on their installation costs.

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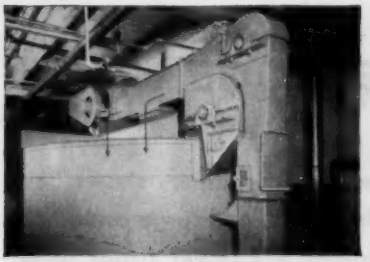
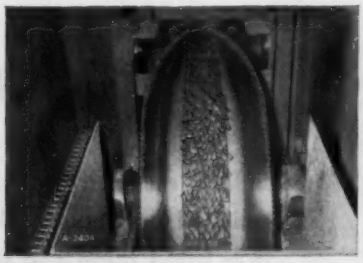
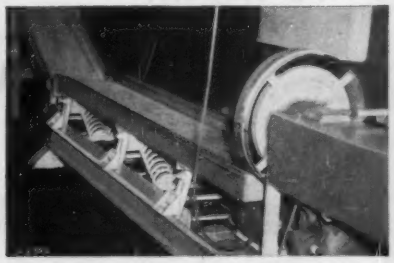


West coast brewery uses a Z-Type REDLER unit to carry ground malt from mill, up and over steel storage tank. Conveyor flights in the totally-enclosed steel casings move product forward en masse, completely protected from loading point to discharge.



S-A Zipper belt handles cocoa beans for a New Jersey food processor. This type of conveyor opens to receive materials, zips closed, and then moves contents along with the belt gently and dust-tight to discharge point where it unzips and unloads.



A natural frequency conveyor is used in a Chicago pickle packing plant to screen off the undersize or imperfect pickle slices. The product moves at rate of 30 to 40 F.P.M. The unit may also be adapted to processing other food products. This process releases employees for other jobs.

# -ADAMSON

## EQUIPMENT

S-A district or main plant offices can supply complete information on any conveyor product, or any phase of bulk material handling. Bulletins on all products are available on request.

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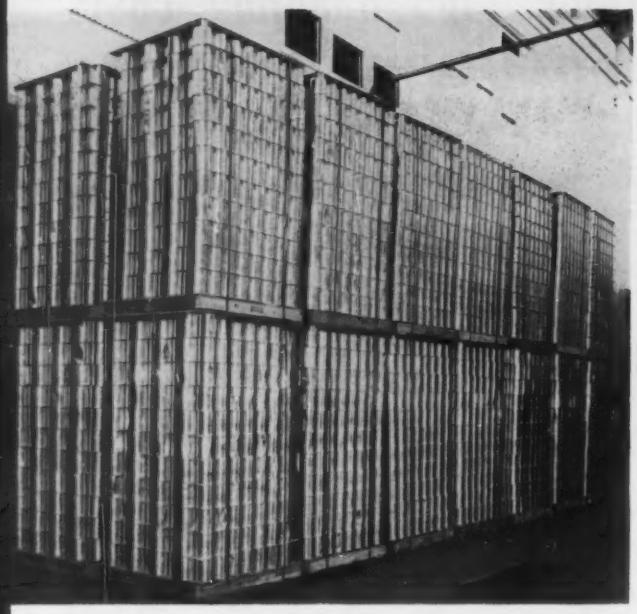


**PALLETLESS LOAD** has fiberboard trays as base and top, parallel ports for fork-truck blades, and top and bottom metal protectors. Steel straps hold cases in place.

**FASTER HANDLING,** less damage in-transit is assured by unitizing bright No. 10s with steel straps on wooden pallet. Dole uses method for inter-plant shipments.

*FE Report:*

# New Handling Methods Point

**Salient research by canners and shippers shows how unitized loads, disposable pallets, and cargo containers will bring these big benefits: (1) Lower traffic rates, (2) damage-free shipments, (3) less manual labor**

SPECTACULAR ADVANCES in canned goods handling and transportation now promise broad economies in distribution. Research in this field—a 2½ yr. project by 6 canners, 4 ship lines and 1 railroad—has centered largely on the West Coast.

Today, many initially experimental methods are in current use by some canners, and have virtually eliminated manual handling and in-transit damage, cut some costs, and made possible mechanized handling between plants and from plant to buyers.

**Integrated, mechanized handling, the ultimate target, may be just around the corner. Inter-plant shipments, in large containers, are now moving in relatively heavy volume by rail, truck, and steamer.**

**Coming next: Unitized shipments, mechanically handled, from cannery straight through to distributors' order-picking racks.**

In a broad perspective, industry-wide, integrated materials handling would also include suppliers—for example, salt, fiber cases, cans, and glassware.

Under such a system, canners' pallets would be delivered to suppliers for loading, or suppliers would provide disposable units. Pallets would be re-used for loading with finished products. The savings in transportation and handling are obvious.

As with any new advance, however, there are problems, too.

Let's first consider the methods and equipment of immediate interest to food canners.

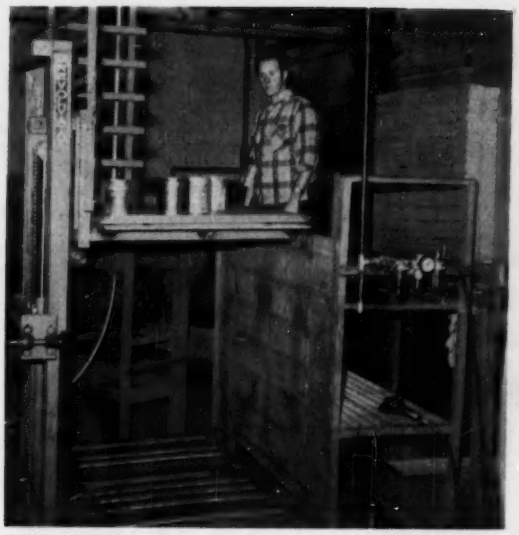
In the limelight are several new methods of unitizing unpalletized loads of cased goods or bright cans—methods coming out of the 2½ yr. study. Their potential use is so broad they presage a major revolution in the handling and transportation of canned foods, especially the unitized cased goods load.

For the most part, companies now using these methods are either multiplant firms, re-manufacturers, or canners supplying products to re-manufacturers. For re-manufacturing, unit loads usually are made up of bright No. 10 cans, although larger containers are also used.

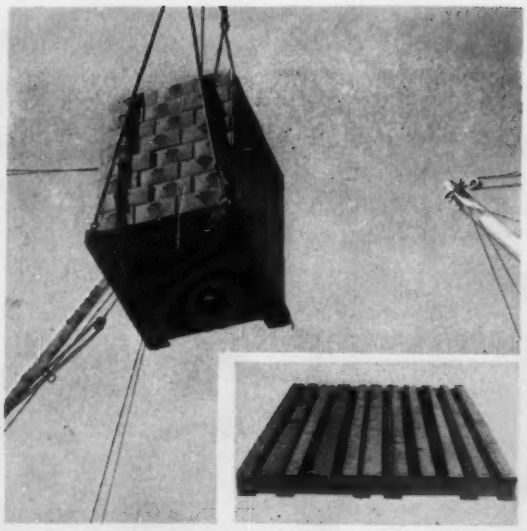
But as long as load is properly constructed, any size cans in fiberboard cases may be unitized. And in either situation (cased or bright), the unit may or may not be palletized.

Multi-plant companies (e.g., pineapple and tomato products canners) are shipping these kinds of loads

**C. R. HAVIGHORST**
Senior Associate Editor, "Food Engineering"



**SEMI-AUTOMATIC** unit (Revolvator) stacks brights for unitization. Operator manually sweeps tins from feed conveyor, then places fiberboard separator atop layer.



**SHIP'S SLINGS** move disposable palletload into stowage between decks. Inset shows typical unit that has 11 top-deck members, 6 bottom-deck ones. It costs about $1.25.

# Way to Lower Distribution Costs

inter-plant as ingredients. Others use them for shipping to re-manufacturers.

Just what are the particularly impressive gains that accrue to canners? And what are the distribution factors from the large unitized loads? Answers are sharply revealed by a few case histories:

## Case No. 1 (Calpak)

**Description:** Twenty-six (45x50 in.) pallets: 20 in ends of car, 6 turned in doorways—average load weighs 42 tons. Automobile or "interior loading-device", double-door (50 ft. x 6 in.) rail cars. Fiberboard separators only dunnage used.

**Time Study:** One fork-lift operator can load/unload palletized car in approximately ¾ man-hour vs. 8 man-hours required to hand-load car.

**Gains:** Larger volume of freight handled because fork-lift moves 3,465-lb. load/trip, compared to conventional lighter loads. And considerable savings result from improved in-plant handling, loading, and unloading of rail-cars. This means reduced traffic rates, since typical tariffs include charges for loading/unloading (based on manual handling of cased goods).

The shipper, carrier, and consignee share these benefits: (1) Some rate reductions, (2) virtual elimination of damage claims, (3) faster turn-around of equipment, (4) increased warehouse through-put efficiencies, and (5) improved storage flexibility.

Present RR rates permit shipment of palletized loads without charge for pallet weight (45x50 in. pallets weighs 58 lb.) However, rate for returning empty pallets to origin point is relatively high when compared to their original cost. If railroads would offer reasonably low rates for return of empties, there would be a far greater volume of palletized shipments.

### *They Swapped Ideas—But Used Them Differently*

**Behind the promising new methods and equipment detailed here are a number of meticulous development studies initiated by a group of several companies (named below).**

**But while these efforts have combined as a "free exchange project," there has not, in fact, been complete agreement between factors relative to costs, savings, program integration, pallet sizes, and disposable pallets.**

**Therefore, data, figures, and some statements presented here are the sole responsibility of each specific company as quoted.**

**Concerns engaged in the research: California Packing, Gerber Products, Hawaiian Pineapple, Hunt Foods, Libby, McNeill & Libby, Thornton Canning, Western Pacific Rail Road, Matson Navigation, States Steamship Lines, Pacific Far East Line, and Oceanic Steamship.**

## Case No. 2 (Calpak)

**Description:** Unpalletized, unitized load of bright No. 10 cans is steel-strapped, and has fiberboard trays (.060 solid fiberboard, scored along edges and turned up for can protection) at top and bottom and between tiers. Weighs approx. 3,000 lb. (according to product), which is equivalent to 50-55 cases of No. 10 cans.

**Gains:** Load unitization is carried out



*For free reprint of this article, write E-1 on Reader Service Card, back of issue*

**CARGO-VAN UNITS** are coming in for wider use because they reduce handlings, offer better anti-pilferage protection. One shown here holds 1,075 cases, is used on ships. Refrigerated and non-refrigerated lading can be handled.

as product is discharged from processing line at Honolulu. If product is hot-filled, and subsequently cooled, perforated fiberboard trays are substituted.

This unitized load: (1) Reduces in-plant handling costs, (2) simplifies efficient movement of loads to dockside and from vessel (by truck or rail car) to destination plant, (3) provides storage flexibility and easy handling prior to re-manufacture, (4) and makes safe shipments practical in interior-device rail cars.

These loads speed vessel turn-around time (which has led to special steamer rates) and, in some instances, lower truck rates.

While the 40x48 in. pallet has its place in materials handling, the larger 45x50 in. unit lends itself to more universal stacking, Calpak feels. And, even though it may require considerable revision in the entire system, the larger pallet should be seriously considered as the size to be used in an industry-wide integrated materials handling system, the firm believes.

## Case No. 3 (Dole)

**Description:** Large, palletized load of unitized bright No. 10 cans contains an average of 100 cases (weight: 5,280 lb.). Unitized with steel-straps on a 44x48 in. conventional wooden pallet, it assures load safety in transit, permits easier mechanical handling, and facilitates three-tier stacking.

A second load type is a unitized, palletized unit of 120 cases (48/8-oz. cans), in a bonded-block stack on a 44x48 in. conventional wooden pallet. Total weight is 4,003 lb.; pallet, 43 lb. Top three tiers are glued, and top tier has a strip of sensitive pressure tape around it for additional protection.

**Time Study:** Both unitized loads provide 50% more efficient in-plant materials handling because fork-lift moves larger loads.

**Gains:** Pallets fit snugly on flat-bed or van-type trucks, and can be loaded/unloaded with fork-lift in 15-20 min.

But one destination-marking is needed for each load, compared to old method of marking each case of un-unitized cased goods. Furthermore, pilferage enroute or in warehouse is prevented, truck rates are reduced, transit damage is virtually eliminated, and high-stacking is facilitated.

## Unitizing Costs Are Low

When you consider the savings and efficiencies gained by unitizing, its costs are relatively low.

Western Pacific Railroad, San Francisco, the only railroad aggressively pushing these new methods, pioneered unitized loads for rail shipment. WPRR's Research Section, cooperating in this study for 2½ yr., is credited with a number of outstanding developments.

WPRR's interest is two-fold: (1) The methods bring efficiencies and savings to shippers, and (2) they virtually eliminate in-transit damage —a problem the railroads have wrestled with a long time.

The following case studies come from WPRR's specifications and costs for unitizing the named types of loads and containers. Some are already in current use.

## Case No. 4 (WPRR-Libby)

**Description:** Unpalletized, bonded-block design is a unit of 85 cases (24/303s), stacked 6-high. Third tier from bottom, containing only 10 cases (others have 15), provides two parallel-ports for fork-truck blades.

Load has fiberboard trays as a base and top, top and bottom metal protectors, and is secured by four steel straps. Unit weight: 2,635 lb. Weight per cu. ft. is 44.6 lb. Designed for 24-unit carload: 63,240 lb.

| Dimen. (In.) | Unit | Fork Ports |
|---|---|---|
| Height | 54¼ | 9 |
| Width | 49 | 8¼ |
| Depth | 38¼ | 38¼ |
| **Materials and Cost:** | | |
| Fiberboard sheets (non-test) 37x48 in, 2@ .15 | | $ .30 |
| Steel strapping (¾x.015 in.) 2.5 lb. @ .20/lb. | | .50 |
| Strap seals (¾ in.) 4 @ .005 ea. | | .02 |
| Metal protectors, 18 lb. @ .01/lb. | | .18 |
| Aprox. total materials cost/unit | | $ 1.00 |
| Aprox. total carload cost (24 units) | | $24.00 |
| Savings same as in Cases 1 and 2 | | |

## Case No. 5 (WPRR-Libby)

**Description:** Unpalletized, bonded-block design has 61 cases (24/2½s), stacked 6-high. Third tier, which contains only 6 cases (other have 11), provides 1 parallel-port for fork-truck blades.

Load has fiberboard trays at base and top, top and bottom metal protectors and is secured by four steel straps. Unit weight: 3,355 lb. Weight per cu. ft., 44.5 lb. Designed for 18-unit carload: 60,390 lb.

| Dimen. (In.) | Unit | Fork Ports |
|---|---|---|
| Height | 59 | 9¾ |
| Width | 49 | 17 |
| Depth | 45 | 45 |
| **Materials and Cost:** | | |
| Fiberboard sheets (200 lb. test, 45x48 in.) 2 @ .179 | | $ .36 |
| Steel strapping (¾x.015 in.), 2½ lb. @ .194/lb. | | .48 |
| Strap seals (¾ in.), 4 @ .005 ea. | | .02 |
| Corner protectors (metal), 23 lb. @ .010/lb. | | .23 |
| Aprox. total unit cost | | $ 1.09 |
| Aprox. total carload cost (18 units) | | $19.62 |
| Savings same as in Cases 1 and 2 | | |

## Case No. 6 (WPRR)

**Description:** Palletized unit (75/5-gal.), currently being used by a Western canner, is covered with a fiberboard tray. Each of three tiers has a fiberboard separator, and the unit is secured by six steel straps.

Unit weight (including pallet): 3,440 lb. Weight per cu. ft., 57.9 lb. Designed for 20-unit carload: 68,800 lb.

**Dimensions:** Height, 46½ in.; width, 47 in.; and depth, 47 in.

**Materials and Costs:**

| | |
|---|---|
| Pallet (47x47in.) double-faced commercial type, 1 @ | $ 1.50 |
| Fiberboard trays (solid, 47x47 in. plus 2-in. flanges), 3 @ .26 | .78 |
| Steel strapping (¾x.015 in.) 3.8 lb. @ .194/lb. | .74 |
| Strap seals (¾ in.), 6 @ .005 ea. | .03 |
| Corner protectors (metal), 8 lb. @ .01 lb. | .08 |
| Aprox. total materials cost/unit | $ 3.13 |
| Aprox. total materials cost/carload | $62.60 |

**Comparative Costs:**

| | Per Can | Per Carload (1,500 Cans) |
|---|---|---|
| Individually cased 5-gal cans | $.063* | $94.50 |
| Unitized uncased cans (75/unit) | .026** | 39.00 |
| Difference (Savings from unitized units) | .037 | 55.50 |

Savings same as in Cases 1 and 2

*Cases used 3 times; includes cost of return freight of cases.

**Fiberboard trays used 3 times; includes return freight of boards and allows ⅓ cost of pallet as chargeable to user at destination.

## Case No. 7 (WPRR)

**Description:** Unpalletized unit of No. 10s, developed for transcontinental movement of uncased canned foods, is made up of 366 cans (equiv. to 61 cases), arranged 6x8 on a fiberboard tray-base. One layer, fourth from bottom, is arranged with two ports for forktruck blades.

Layers are separated, and top is covered by other fiberboard trays. Angle iron or metal protectors are placed around units' top and bottom edges, and high-tensile steel wire secures load. Unit weight: 3,000 lb. Weight per cu. ft., 50 lb.

Canners use various designs. Some unitize up to 110 cases (660 cans) with total weight of 5,280 lb., and some protect the unit with heavy kraft paper.

| Dimen. (In.) | Unit | Fork Ports |
|---|---|---|
| Height | 58½ | 7 |
| Width | 49½ | 9 |
| Depth | 37½ | 37½ |

**Materials and Cost:**

| | |
|---|---|
| Fiberboard sheets (37½x49½ in.), 3.34 lb. each, solid, plus 2 flanges, 45 deg. dubbed corners, 8 sheets @ .30 ea. | $ 2.40 |
| Fiberboard sheet (36x48 in.) plain, .060 in., solid | .15 |
| 13-ga. high-tensile steel wire, 2.32 lb. | .41 |
| Corner protectors (metal), 22 lb. at .01/lb. | .22 |
| Aprox. total materials cost for unit | $ 3.18 |

Total materials weight for unit: 54.04 lb.

**Comparative Costs** (based on materials per carload, one use):

| | Approx. Carload Cost 1,220 cs. Case Method | 20-units Unit Method |
|---|---|---|
| Cases (Size 6 No. 10), $0.127 ea. | $154.94 | .... |
| Fiberboard trays | .... | $54.00 |
| Steel strap, 13 ga. round wire @ $0.177/lb. | .... | 8.32 |
| Metal corner protectors | .... | 17.60 |
| | $154.94 | $79.92 |

Unit method savings (carload basis) ..... $75.02

Unit method savings (per case) ..... 0.062

**Comparative Costs** (Basis: Experience with major canner building units—61 cases equivalent, bright No. 10s—direct from production line, using Revolvator.):

Rate of production: 50 cans/min., 24,000 cans/8-hr. shift

Additional labor (8-hr. shift):

| | |
|---|---|
| Two men to strap units | $ 32.00 |
| Materials cost for units (65 units/day/$4 per unit) | 260.00 |
| Total material cost | $292.00 |
| 4,000 cases at 12¢ each (equiv. 24,000 cans/8 hr. shift) | $480.00 |
| Savings: Unit method | $188.00 |
| Labor to load box cars (basis: 8-hr./shift production of 65 units equiv. to 3 carloads at estimated savings of $20 per car) | $ 60.00 |
| Total savings: Unitizing and carloading (basis: 8/hr.-shift) | $248.00 |

## Case No. 8 (WPRR)

**Description:** Developed for transporting 55-gal. drums secured by two steel straps. Final tests are completed and at least one canner is currently using it.

Unit comprises four drums, separated from each other by wooden dunnage, which projects beyond drums to form a "lifting-beam". Simple hook arrangement, or sling, readily fixed to fork-truck blades, is attached to lifting-beam. One man can make up unit in 4-6 min.

**Dimensions:** Height, 35 in.; width, 46 in.; depth, 47 in.

**Materials:**

| | |
|---|---|
| 2 pieces lumber (1x8x46 in.) | |
| Steel strapping (¾x.035 in.), 33 ft. | |
| 2 strap seals (¾ in.) | |
| Aprox. total cost | 80¢ to 90¢ |

Savings same as in Cases No. 1 and 2

(Turn Page)

## *Target: Industry-Integrated System*

**There's no denying the food-distribution economies promised by an integrated materials handling system. But before the industry can win them, a more cooperative arrangement and greater uniformity of equipment must be developed.**

**The canner and his suppliers may be the logical origin for unitized-palletized packages. And since every factor in the canned food distribution system thus would benefit, it is only good business that all should assume a pro-rata of the costs.**

**Uniformity of pallet sizes and types especially must be developed. But the knotty problems thus posed are evident when you consider that different can sizes require different sizes of fiberboard cases, hence different pallet sizes.**

**Some canners use 45x50-in. pallets; others, 40x48-in. units. There seems to be no particular size required for steamer shipment. However, with use of interior-device cars, or the relatively new pneumatic dunnage equipment, either the 45x50-in. or 40x48-in. pallet may safely be used.**

**But among wholesale food distributors, the 40x48-in. pallet seems favored. In fact, in many instances these concerns have designed their handling, storage, and order-picking around this size unit.**

**The problem gets more complex when less-than-carload and less-than-palletload lots are ordered by distributors. A partial solution might lie in predicating shipments on the basis of a palletload, or on a uniform size of a unitized, unpalletized load.**

**Transfer of goods by hand from a pallet of one size to another of a different size is too costly. Virtually all savings would be lost.**

**It is relatively inexpensive, however, to transfer goods from, say a standard warehouse pallet to a disposable pallet of the same size. This is done with a carton clamp-truck that handles a complete load of cased goods (1½ to 2 tons) at a fraction of manual costs.**

**Presently, it seems that the best, most far reaching solution to integrated materials handling would be afforded by a satisfactory disposable pallet, or use of unitized, unpalletized loads. First, of course, attendant costs and their division among distribution factors must be cooperatively determined along with pallet and package sizes.**

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The obvious advantages of mechanically handling large loads by palletization in the plant has prompted considerable research for a means by which pallets can be used for domestic shipments.

## Now—"Disposable Pallet"

A San Francisco warehouse had evolved a system by which loads could be shipped on conventional pallets, with pallets then returned to point of origin. But because of little industrial interest, costs involved were prohibitive, so the plan was discarded.

About the same time, interest turned to low-cost, expendable pallets. It was felt that their cost would be defrayed by handling savings—since no return was involved.

## Two Throw-Aways Debut

Recently, two disposable units have appeared—The "Expend-A-Board" and the "Shipaway" pallet.

Expend-A-Board, jointly developed by Encinal Terminal and Weyerhauser Timber Co., utilizes heavy plywood trim, heretofore considered useless for top and bottom deck pieces.

There are light and heavy duty Shipaway units. The heavy duty one is composed of extra Mullen Factor paper, maximum number of wooden deck strips, single or dual posts, and base runners for maximum load capacity and protection. Another disposable pallet is manufactured by Pioneer Pallet Co.

Among the remaining road blocks

**PERFORATED TRAY** is employed for palletizing hot-filled products that must be cooled. It eliminates hand-stacking on conventional cooling trays.

to greater use of disposable pallets is the original cost of these pallets—starting prices ranging from 85¢ to $1.35. Also, to have a supply on hand, a good stock of pallets would have to be warehoused and handled.

Nonetheless, these pallets are a step in the right direction. And if sufficiently strong units of required sizes can be obtained, they may have the effect of accelerating this potential program.

### Steamer's Piggy-Back Vans

Several steamship companies, plying between San Francisco and a number of domestic and foreign ports, have developed cargo vans of various sizes. Matson Navigation Co. is one of the first to design and build cargo containers which, in size, resemble the railroads' piggy-back truck-trailers.

At the shippers' place of business, freight is loaded into these marine vans and it may be delivered in the same van to the consignee's door at the shipment's destination. This system requires but two handlings: One when the van is loaded, again when unloaded. This compares favorably to the seven or eight handlings in conventional steamer shipping.

### Land, Sea Savings

This 'containerization' program is designed to reduce costs and improve efficiency ashore and afloat. It offers these benefits:

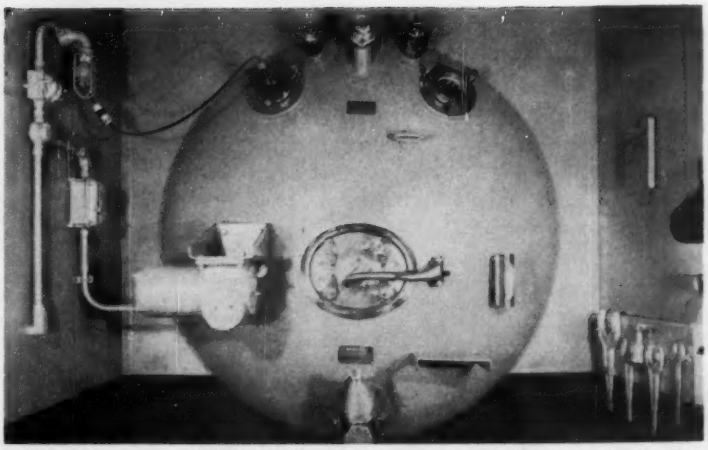
**1. Speed of shipment: Port time is reduced at each end of line. And, when the system is fully operative, goods can be in the hands of a customer a day or so after ship arrival.**

**2. Virtual elimination of damage and pilferage because merchandise is protected by container.**

**3. Closer liaison between rail, truck, and marine facilities, which generates savings.**

Matson's program will begin with conversion of six vessels of its present freighter fleet to carry deckloads of vans. Three of these vessels will provide weekly service between San Francisco and Honolulu, the other three between Los Angeles and Honolulu.

Long-range plans calls for conversion of several freighters in the present Matson fleet to carry vans exclusively, below deck as well as on deck. These vessels will become part of a fleet of freighters equipped to carry vans and non-van cargo in the holds. —*End*



**LOADING END** of 4,000-gal. glass-lined tank in insulated RR car for hauling bulk beer. Each car has two tanks.

# Beer Shipping Cost Cut 50%

**Canadian brewery uses rail tank cars to move beverage in bulk while developing new market**

BULK-SHIPPING OF BEER in rail tank cars is claiming double benefits for Molson's Brewery Ltd. in Canada.

1. It enables Molson's to develop a market before going to the expense of building a brewery in that area.

2. And it does it economically since bulk-shipping is only half as costly as transporting bottled beer.

Molson's began bulk-shipping in 1955 when it opened a new lager brewery and bottling plant in Toronto. Ale brewed at the main plant in Montreal is shipped to Toronto for bottling, while the Toronto-made lager is back-hauled in the tank cars to Montreal.

### Down to Figures

It costs 34c. per cwt. to ship beer in pint bottles, 38c. in bulk. Yet bulk-shipping is only half as expensive because weight of bottles and cartons is eliminated. Of the 38½ lb. total weight of 24 pints of beer in bottles, only 18 lb. is beverage.

Using equipment leased from General American Transportation Corp., Molson's operates seven cars daily in overnight service between Montreal and Toronto—330 miles.

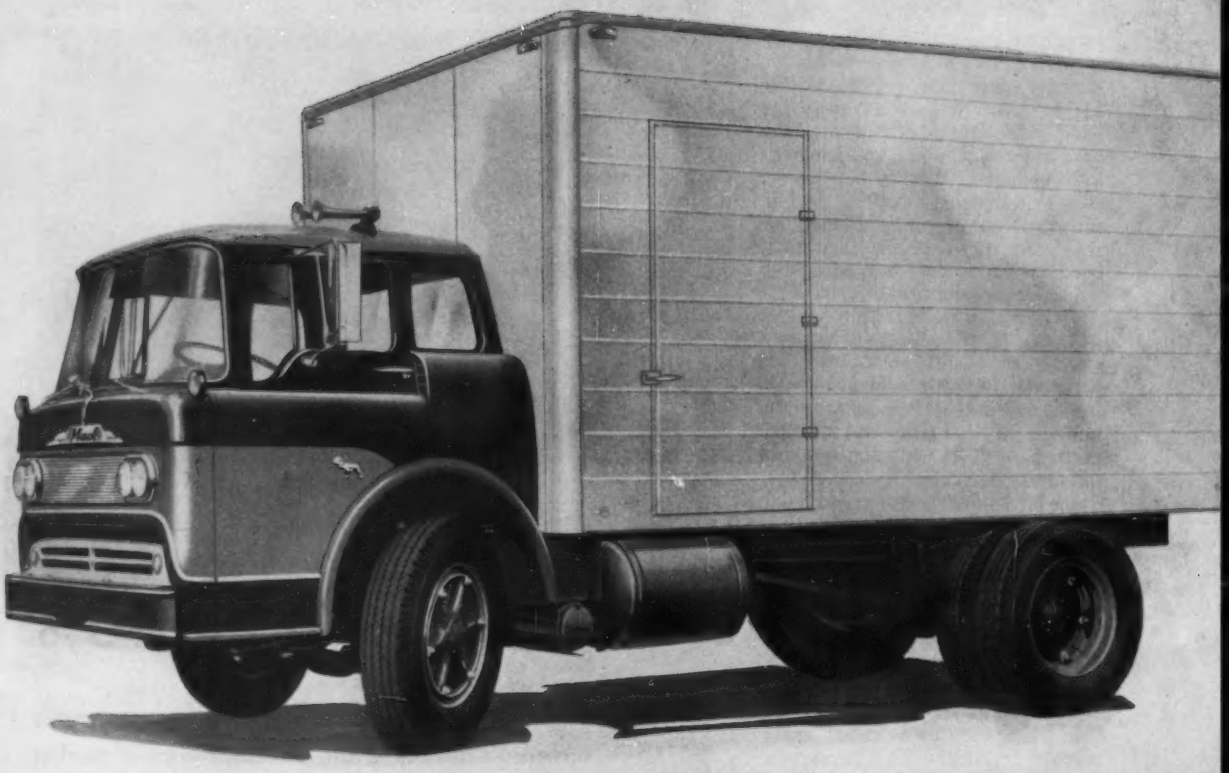
Each car has two 4,000-gal. Pfaudler glass-lined tanks, with doorway between the tanks for loading and unloading operations. The ale-loaded cars are hooked to a fast freight late each afternoon in Montreal. Leaving there at 7:00 p.m., they are delivered to the Toronto plant about 8:30 the following morning. On the return trip, loaded with lager beer, the cars leave Toronto about 6:30 p.m. and arrive at the Montreal plant about 7:00 a.m. During the trip, the insulated tanks hold the beer at 32F.

Unloading at Toronto is done from a railway siding, through hose connections in the wall of the brewery. The beer is pumped to storage tanks on the second floor, and a tank car is emptied in about 1 hr. Then the tanks are washed before being filled for the return trip.

As the Toronto market developed, the company decided to expand its operations there and began brewing certain ales in addition to the lager. Some experimentation with formulas was necessary to assure that the Toronto ale would have an identical flavor to that produced in Montreal.

Production at the Toronto plant is nearing the stage where shipment of most ale from Montreal will cease.

However, the Toronto plant is to be enlarged next year and will continue to ship lager and some ale to the Montreal plant. —*End*



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These compact cost-busters give you every feature needed for economy, bonus payloads, and fast action in and out of congested areas. That's why Mack Model N COE trucks and tractors are winning immediate acceptance by dollar-conscious operators throughout the nation.

For the names of firms that are already cashing in on the advanced profit-power of Mack Model N's . . . or for a briefing on the Model N that will do as much for you—contact your Mack branch or distributor today! Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

**MACK** *first name for* **TRUCKS**

**CLEVER NOVELTIES** come attached to colorful, whimsical mailing covers. They win high readership for Green Giant's direct mail. Left to right: Note-holder for use on telephone, ball-point pen rifle, and trick monkey.

# Gadget-Mail Boosts Sales

**Green Giant's novelties help win retailer support for latest in-store promotions**

HOW DO you get busy chain and wholesale buyers to read your direct mail despite the deluge of literature they receive every day?

The right answer to that problem is more important than ever before now that postal-rate increases put a tighter squeeze on advertising dollars.

One successful method—that helps Green Giant to get its sales messages read—is "gadget mail." The LeSueur, Minn., packer, whose direct mail program lays the groundwork for future merchandising campaigns, hooks buyer readership by placing humorous novelties on the mailing pieces. These put a smile on the buyer's face and make him more receptive to GG product-promotions.

Explains Jack Mullowney, advertising director: "We attach a catchy gadget to a colorful front cover and thus introduce an element of fun or anticipation. The novelty captures the buyer's attention and puts him in the right mood for the whimsical copy that's inside the folder."

Gadget-mail isn't new, but GG gives it new wrinkle each month with clever usable novelties that are original and different.

So effective are the gadgets that they double-serve as effective door-openers for the firm's salesmen when they call on buyers to finalize promotion plans.

Prime objective of the gadget-mail, Mullowney points out, is to merchandise GG's advertising plans and win retailer tie-in cooperation. Along with the gadget, a typical mail folder includes preprints of forthcoming advertisements, point-of-sale illustrations—mats, shelf talkers, store posters—and a postage-paid order card that is provided for those who may want to order the material.

To get maximum mileage from the mailings, the company sends them out eight weeks before the ads are to appear. They go to 12,000 key personnel—buyers, merchandisers, advertising directors—among the firm's direct buying accounts, as well as to salesmen and brokers. During the year, there are 10 to 12 mailings.

Mullowney concedes that the gadgets make GG's direct mail program "quite a fair investment." But sales-producing results more than justify their costs, he stresses.

For one thing, the catchy mailings prompt tie-in promotions by retailers. And the substantial number of order cards that come in show how widely the in-store aids will be used.

To get an accurate fix on buyer response to the gadget-mail, GG recently inserted a card with one of the mailings asking for comments—and got back more than 1,500 cards (a hefty 12% return). Typical comment was: "Each time we see your envelope we wonder what you're up to this time." —*FE Staff*

You can
STEAM HOSE
SANITILE WALLS

SANITILE takes punishing exposure to steam hosing in food plants where steam cleaning is part of daily sanitation programs. Leading meat packers, dairies, bakers, brewers, poultry processors, canners and other food processors have maintained highest sanitary standards with SANITILE. Under difficult food-plant operating conditions SANITILE usually saves the cost and inconvenience of 2 to 4 repaintings. Over 40 years of helping food processors eliminate problems and raise sanitary standards stand behind the performance of unique SANITILE.

*SANITILE meets exacting requirements for sanitary, smooth and washable surfaces over cement block, brick, plaster, wood and composition walls. SANITILE resists blood, fats and oils, sugar, salts, alkalies, water and condensation . . . prevents mould and fungus.*

Applied by brush or spray, SANITILE creates a one-piece, ceramic-like surface at less than 1/15th the cost of tile. Write for specifications.

*Serving the Food Industry since 1913*

MASTER MECHANICS

THE MASTER MECHANICS COMPANY
2097 Columbus Road • Cleveland 13, Ohio
The Master Mechanics Chemicals Co., (Canada) Ltd.

# Give a PLUS to your product

**Brighter Appearance • Better Texture and Consistency • Finer and Fresher Flavor with EXCHANGE Products from Citrus**

### Exchange Pure California Lemon Juice

Lemon juice is nature's most effective anti-oxidant. It contains many organic reductants, including ascorbic acid and a rather broad group of phenolic anti-oxidants which fall under the classification of flavonoids, sulphydryl-like compounds and possibly flavonols, which act synergistically to give lemon juice its remarkable anti-oxidant properties. It discourages the growth of microorganisms, retards enzymatic action, prevents oxidative browning, reduces the pH of low acid foods and actually possesses the ability to enhance natural food flavor in many foods such as the natural peach flavor in freestone peaches. It is prepared by Sunkist Growers especially for industry use in baby foods, low acid fruits and vegetables, canned and frozen fruits, fruit juices and nectars, mayonnaise and salad dressings, sea foods in all forms, cured meats and wherever a problem of appearance or perishable flavor exists.

### Exchange Citrus Pectin— Slow Set and Rapid Set

There is one tailored to your special need. They are used by more American preservers, confectioners, and food processors than all other brands *combined*. Guaranteed by Sunkist.*

### Exchange Low Methoxyl Pectin— Pectin L. M.

The *only* pectin that forms a true jell without sugar. It is the exclusive choice for aspics, jellied fruit and vegetable salads, low calorie jams, and dietetic fruit jells. Guaranteed by Sunkist.*

### Exchange Pure California Orange Juice

Gives your product more of the true fruit characteristics—because it is made from California oranges, known for their richer content of ascorbic acid, amino acids, polysaccharide complexes, B complex factors, carotene (pro-vitamin A), and aromatic flavor compounds. Prepared especially for the food and beverage industry. Guaranteed by Sunkist.*

### Exchange Frozen Lemon Puree and Exchange Frozen Orange Puree

Both purees of whole lemons and oranges (seeds removed) are standardized in juice acidity, sugar content and flavor. Purees give a like-fresh tangy taste to food recipes and beverage formulas. Guaranteed by Sunkist.*

### Exchange Lemon Oil, U. S. P.— California Cold Pressed

Because of its clarity, uniformity and flavor intensity, it is the 10 to 1 choice over all other lemon oils sold in America. Never needs pre-testing when received in EXCHANGE-sealed containers. Guaranteed by Sunkist.*

### Exchange Orange Oil, U. S. P.— California Cold Pressed

For true aromatic flavor, full color intensity and pure California flavor strength, EXCHANGE brand is the orange oil standard of the world. Guaranteed by Sunkist.*

### *Guaranteed by Sunkist

EXCHANGE brand citrus products are produced and guaranteed by Sunkist Growers, Inc., representing the world's largest supplies of lemons and rich California oranges.

Every EXCHANGE brand product is made in our own ultramodern plants to the highest standards of purity, quality and uniformity.

If you would like information on how Sunkist Research may help you to improve one of your products, write to:

Section "O"

**Sunkist Growers**

INDUSTRY SALES DIVISION
720 East Sunkist
Ontario, California

# CASE HISTORY OF MONTH

From files of *National Consumer Panel Division of Market Research Corp. of America.* Material is factually correct. Identities of product and companies have been masked to insure anonymity.—The Editors

## Are Consumer Deals Worth It?

**Management's problem**

WE HAVE BEEN FOLLOWING a policy of heavy consumer dealing. This form of merchandising is, of course, a costly one. But there are a large number of brands in our product class, and conditions are very competitive.

Two questions we would like answers to are: 1) How necessary are the deals? 2) Must we continue at the present level, or can we afford to cut down?

### What Would You Do?

**Management's decision**

To determine the actual importance of consumer deals in our sales picture, management authorized an analysis of purchase records of families in the National Consumer Panel. This analysis sought to—

1. Compare the characteristics of the people who had bought our deals with the characteristics of people who were heavy buyers of this type of product.
2. Learn the average number of brands customers buy in the course of a year, and match this figure with the average number of brands bought by our deal buyers.
3. Study the purchases of our deal buyers in order to ascertain how many were new customers, and how many were repeat customers.
4. Find out more about deal buyers in terms of their subsequent purchases.

The findings all pointed in one direction.

**Result of action**

First, the kind of people buying our deals did not closely "match" the heavy buyers of the product.

Second, our buyers purchased many more brands in the span of a year than was average for users of the product. For example, 9% of our buyers purchased one brand, 27% two brands, 24% three brands, and 40% bought more than three brands.

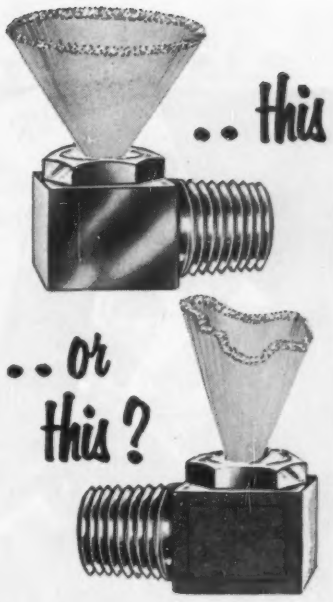
By contrast, among other customers 43% purchased one brand, 33% two brands, 16% three brands, and only 8% bought more than three brands. Thus, we were getting "shoppers," not regular customers.

Finally, while almost two-thirds of the people who bought our deals were new customers, our retention rate was only about 20%.

On the basis of these findings, management decided to reduce the amount of deal activity. True, the deals were attracting new customers—but these customers were not the desirable loyal kind.

The conclusion, therefore, was that other forms of merchandising were called for. Deals could be used less frequently and still produce equal benefits.

For more information, write to Case-History Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y. Your inquiry will be directed to source of case-history item.


BE SURE OF A PERFECT CONICAL SHAPE SPRAY ALL THE TIME WITH *Monarch*

For a perfect spray, many food processing plants prefer Monarch nozzles.

This advanced design nozzle reduces clogging and guarantees dependable food processing applications to . . .

- WAX FRUITS
- RINSE VEGETABLES
- POWDER MILK
- DRY EGGS
- WASH FILTER CAKE
- HUMIDIFY BANANA ROOMS

*Send for Catalog 1*

Monarch
MFG. WORKS, INC.
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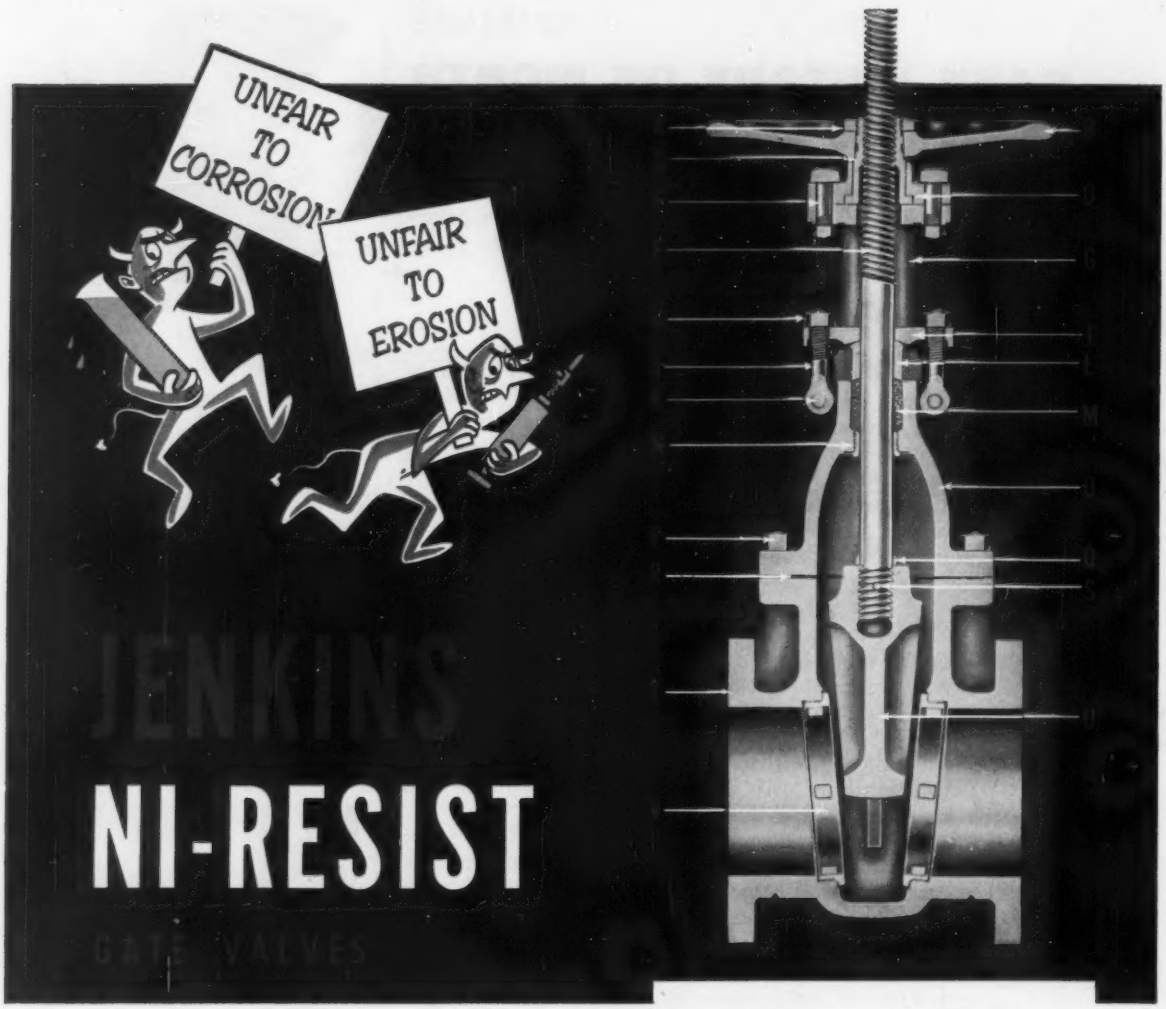
PHILADELPHIA 34, PA.




A Bronze yoke bushing nut
B Handy grip iron wheel
C Bronze yoke bushing
D Iron yoke cap with zerk fitting for lubricating bushing
E Steel yoke cap bolts and nuts
F TYPE 316 STAINLESS STEEL spindle
G NI-RESIST CAST IRON, TYPE 2, yoke
H Bronze eye bolt nuts
I Malleable iron gland flange
J Steel gland eye bolts
K Steel gland lug bolts and nuts
L TYPE 316 STAINLESS STEEL gland
M Teflon impregnated asbestos packing
N TYPE 316 STAINLESS STEEL bonnet bushing
O NI-RESIST CAST IRON, TYPE 2, bonnet
P Steel bonnet bolts and nuts
Q TYPE 316 STAINLESS STEEL spindle ring
R Asbestos gasket
S TYPE 316 STAINLESS STEEL wedge pin
T NI-RESIST CAST IRON, TYPE 2, through-port body
U TYPE 316 STAINLESS STEEL solid I-beam wedge
V TYPE 316 STAINLESS STEEL seat rings

Wherever valves are attacked by acids, salt and alkaline solutions, sea water, brine or other corrosive fluids, vapors or gases, "Jenkins Ni-Resist Gate Valves" are *fighting* words.

In a wide range of corrosive and erosive services common to the chemical, food, plastics, marine, petroleum, and pulp and paper industries, these valves have shown a remarkable ability to withstand corrosion and cut valve costs.

The secret of their long, trouble-free service is the combination of Ni-Resist type 2 cast iron and type 316 stainless steel trim, plus Jenkins *extra value* construction throughout. No other gate valves offer this combination for fighting corrosion.

When choosing Ni-Resist valves, let the famous Jenkins Diamond be your guide. Specify "JENKINS NI-RESIST" — for longer valve life. Write us, or ask your Jenkins Distributor for information folder No. 205. Jenkins Bros., 100 Park Avenue, New York 17.

JENKINS
LOOK FOR THE JENKINS DIAMOND
VALVES
JENKINS
SINCE 1864
Jenkins Bros.

Sold Through Leading Distributors Everywhere

## 'Prepareds' Booming Without Letup

Continued uptrend in sales of cooked frozens is seen by Stouffer Corp. as a result of a market survey it just completed. Findings indicate that by '62 Americans will snap up $1.1 billion worth of the frozen prepareds, compared to $439 million in '57.

Stouffer also foresees a 60% rise in the total expenditure for food in the next 10 yr., along with a hike in eating-out volume from $72 billion to $115 billion. Part of the increase will come from greater population, Stouffer feels, but the bulk of it will be due to upgraded diets that lean more on a wider assortment of convenience foods.

## Meat-Packer Selling Needs Overhaul

Selling efforts by meat-packer salesmen aren't keeping up with today's marketing conditions, says John J. Kielty, pres., Poetzinger, Dechert & Kielty. He told the recent AMI convention that a 2 yr. field survey showed that the men did little preparation for their calls and little follow-through after calls were made.

Kielty urged packers to activate more effective sales training programs and pointed to Campbell Soup and General Foods as good examples to emulate.

Campbell has a 2-week basic training session for new men, a 1-week course for advanced salesmen, a sales supervisor training course, and a 3-day training workshop for district managers once a year. GF's men are afforded seven different courses targeting products, sales, and manager training, a 1-day field-training session by district managers every 3 months, and a field-training workshop for sales supervisors every 4 months.

## Chains Eye Precooked Field

Up to now, private label expansion by food store chains in the frozen food area has concentrated upon fast-moving concentrates, vegetables, and fruits (such as strawberries). As for specialty items, the retailers have limited their own brands to fish sticks and pot pies.

But now there are signs that the chains are ready to hang their own brands on prepared foods.

Convinced that precooked items have moved out of the specialty class, Topco Associates is bringing out a private label line that includes products like stuffed green peppers, macaroni and beef, chicken a la king, potatoes au gratin, and sliced turkey for two.

## Fruit Drinks Carve Out Big Gains

Inroads made by the newer non-carbonated fruit drinks—including combination beverages—are tabulated in an American Can survey of consumption of fruit and vegetable juices and drinks in the summer of '57.

The newer items account for 31% of all urban home servings, versus 57% for straight fruit juices, and 12% for vegetable juices.

Other findings: 1) Americans consume about 1 billion servings of the products each week during warm weather. 2) 49% of the juices and juice drinks were of single-strength or ready-to-serve form, 41% concentrated, 3% chilled in cartons, and 7% home prepared. 3) 44% of the servings were made at breakfast time, 16% at lunch or dinner, and 40% between meals.

## Sharper Ad Strategy Urged

Population 'explosion' and rising media costs are making mass advertising uneconomic, Edwin W. Ebel, General Foods executive, told a recent meeting of the National Industrial Conference Board. He said food marketers must first find out who makes up their market —through sharper research into consumers likes and dislikes—and then direct their advertising at this population segment.

Greatest productivity of ad dollars is also called for by the fact that the average family is exposed to 1,500 advertisements daily, he added. And this competition is compounded by the 5,000 products that vie for the housewife's attention when she shops in a modern supermarket.

## Keeping Stocks-On-Hand Targeted

Eliminating profit-draining out-of-stocks calls for the kind of careful advance planning on distribution that Gold Medal Candy Corp., New York, carried out prior to entering 20 new markets this fall.

Last spring, this company commissioned a traffic consulting firm to make a detailed study of the confectioner's sales and distribution pattern. Results were coordinated with company's expected share of the 5¢ candy market to form the basis for formation of a distribution web covering six regional warehousing operations from coast to coast.

The new system is geared to provide immediate shipments from any one of the six strategically located storage sites. Aim is to avoid any possible distribution bottleneck at a time when demand for the company's product is at an all-time high.

## BRIEFS

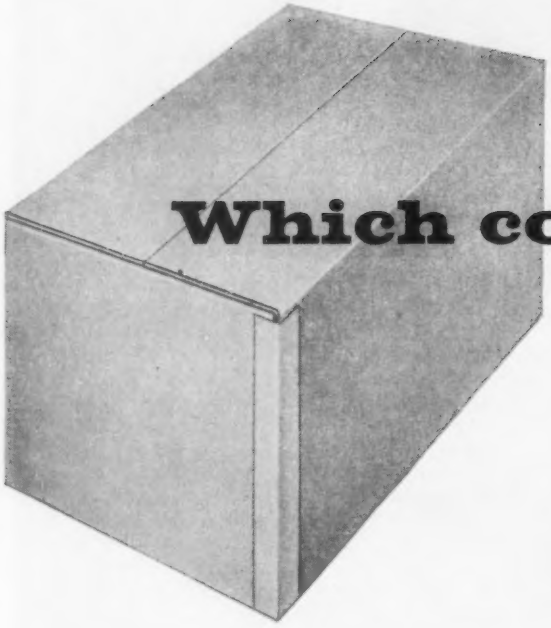
**Drive to up candy sales** got underway last month with manufacturers sending to retailers first of millions of box inserts that stress profit potentials of sweets.

**Group promotion of canned vegetables** by Wisconsin canneries is being watched closely by independent packers who lack resources for big-ticket marketing.

**Six new films** that provide basic information about dairy foods and offer new serving ideas have been released for TV and general audience use by American Dairy Assn.

**Bigger export market for citrus concentrates** is seen with announcement that West Germany may drop bars against imports of 6-oz. cans of concentrate products.

*What you should know about "manufacturer's joints" in Union Boxes.*



# Which corner of a box

One corner is more important than the rest: where your corrugated shipping container is held together. This "hinge", or manufacturer's joint, often holds the key to your box's performance.

As the illustrations show, manufacturer's joints comprise three basic types: taped, stitched, and glued-lap. Each does a special job. Knowing which to use, and when, calls for a detailed analysis of your product and how it will be shipped.

Union Box engineers will be glad to make such a study for you. This is part of Union's complete structural design service. These fundamentals, however, are excellent guides:

**Many shippers prefer tape**

**Taped Joint** (outside)

Tape is generally gum-backed, reinforced kraft paper or cloth, having high tear strength, especially in the lengthwise direction. Tapes are 2, 2½ and 3 inches wide and come in varying grades depending on degree of strength required.

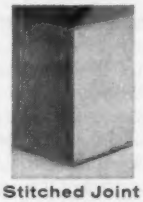
# should you examine first?

Advantages: no projections. In stacking, boxes lie flat, rock less. Also, entire interior area of box can be used. The taped joint is continuous, too . . . seals out dust and dirt. And it folds to make a true box corner.

On the other hand, tape is frequently more expensive than other manufacturer's joints. It can be adversely affected by moisture also. In some cases, tape may interfere with printing.

**The sturdy stitch**

Frequently used for heavy items like canned goods, this joint uses steel staples driven from the outside of the box panel. It is probably the strongest "hinge", gives the most positive closure, and is not affected by moisture or cold. It is usually the least expensive.



Stitched Joint (outside)

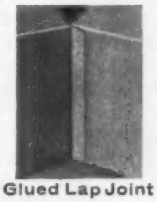
The closure, however, is not continuous. And, since the metal stitches may protrude inside the box, this joint is normally not recommended for fragile and prone-to-scratch articles.

The diagonal stitched joint shown is a typical arrangement. Others include vertical, horizontal, and double stitching.

**Glued lap . . . the versatile joint**

Flap may be adhered either to the inside or outside of the box, and to the end or side panel. Inside-flap gluing is the most popular. It is the only joint which leaves a completely uninterrupted exterior printing surface.

Like the taped joint, the glued lap joint is continuous . . . forms a true fold. Performance under adverse moisture conditions is questionable. Also, inside-lap does not give 100% clear inside-packing area.



Glued Lap Joint (inside)

Take full advantage of Union's accumulated knowledge in constructing and recommending manufacturer's joints for shippers in every industry. Consistently well-engineered features such as these offer the surest protection for your product and your shipping investment.

union camp

*Write for Union's free, informative booklet "Manufacturing Corrugated Boxes."*

**UNION BOXES**

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**233 BROADWAY, NEW YORK 7, N. Y.**

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*Southern Division—P.O. Box 570, Savannah, Ga.; P.O. Box 454, Lakeland, Fla.*
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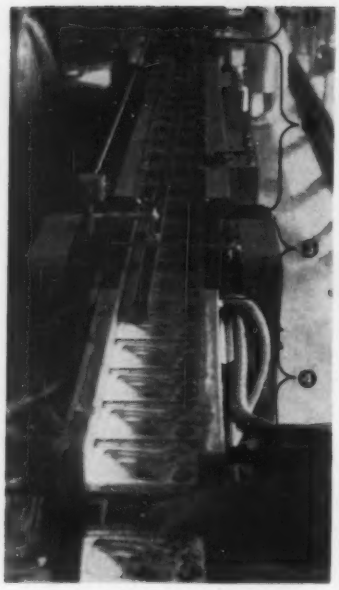
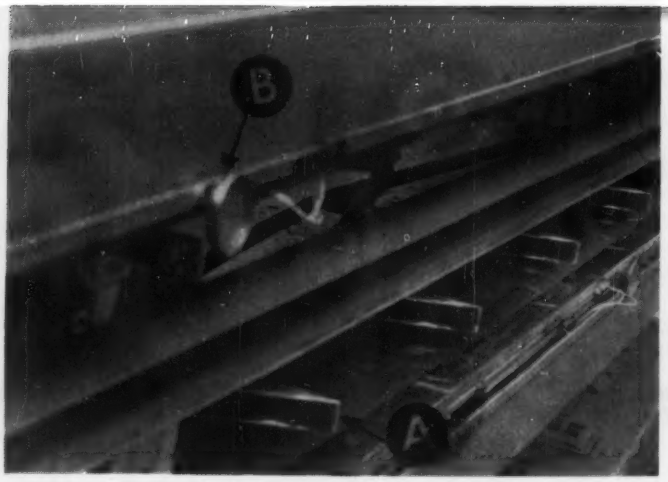





**CARTONS SLIDE BY** four conversion sections on roller chain-mounted "dogs" (A). Thermometers (B) permit check and close adjustment of plate temperatures.

**LONG VIEW** of packaging line shows four steps in 32-ft. cartoning assembly. Boxes are formed and filled with product (1), then move to conversion section where flaps are sealed (2). In turn, cartons then go through first and second cooling sections (3) and (4).

# *Cold* Adhesive Gives Big Boost

**New sealer and application method provide effective MVT barrier for cold-water wax-treated boxes . . . Saves costs by eliminating need for wrapping material and machine**

WRAPPERLESS CARTONS, that save you money by eliminating the cost of overwrap material, wrapping machines, and the manual labor to run them, have mushroomed into a fast-moving trend.

Helping out have been: (1) Development of a special paperboard that brings new color and printing dimensions to food cartons, and (2) perfection of a built-in tear-strip device that makes it easy for the housewife to open tightly sealed containers.

Despite that, packaging engineers have long felt that the biggest breakthrough would come with the successful answer to the problem: "How to develop a wax and a cold adhesive that will withstand below-zero temperatures and provide sufficient MVT protection (moisture-vapor transmission) for perishable items (such as frozen foods) packed in wrapperless paperboard cartons?"

Now they have their answer—a new cold adhesive, a special wax, and a method for applying the adhesive to produce a positive seal.

This significant advance eliminates the shortcomings associated with the hot-melt method of sealing cold water wax-treated cartons—such as brittleness of sealing material at low temperatures, and the costs of preheating to about 375F. It's accomplished—and at a cost saving—by a method that calls for *cohesion*—rather than *adhesion*—of sealing material in ready-to-use state without mixing or preheating.

The chemical reaction of this adhesive, under varying temperatures to which carton is submitted in cartoning machine, is described as "catalytic." It utilizes the wax as a "flux" that floats the adhesive over the carton's flaps.

Further, the fiber-adhesion of the seal and interlocking of the carton's paperboard fibers make the package structurally stronger than one sealed with an adhesive that doesn't penetrate the fibers and provide fiber-adhesion. Scoring the carton also helps the free-flowing adhesive to penetrate to the container's corners, assuring a better seal.

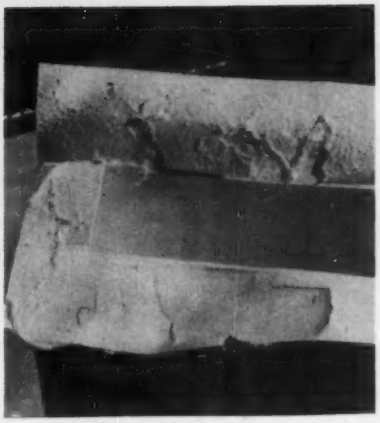
## Other Factors, Too

Of equal importance in this advance was an accompanying study of MVT tests of various combinations of wax coatings and paperboards for this new carton. Included, as well, was a study of the degree of vapor transmission through the twelve score lines, broken and folded, of this carton.

Results disclosed an MVT of 1.9g. per 1,000 sq. in. per 24 hr. The manufacturer assures that all

**Creating The Package**

**PRODUCT** in aluminum foil-covered trays is taken from in-feed conveyor and inserted into formed carton blanks.



**HAND TEAR-TEST** with dummy package seal demonstrates how adhesive has penetrated paperboard fiber. When opened in this manner, sealed fibers of all flaps are ruptured and little waxed surface remains.

# To No-Wrap Waxed Cartons

factors concerned in this package are toxin- and odor-free, and that ingredients of the adhesive, wax, and inks have FDA approval.

Now in commercial use at Chet's Famous Foods, Eugene, Ore., this new advance has successfully gone through its shake-down. It's used by CFF for packaging 16 different frozen products (food items, dinners, and pies) in five different carton sizes.

Lower packaging costs and improved carton appeal are the most impressive gains reported by this well-known Western processor. Packaging costs are slashed by—

**1. Elimination of carton overwraps and wrapping machines.**

**2. Savings in operating labor.**

**3. Lower cost of adhesive.**

**4. Abolishing of machine cleanup that's often necessary with hot adhesives.**

Furthermore, the new method produces a superior package that—

**1. Has a strong fiber-adhesive seal. (Since closure is 'weld-tight', supplier is working on a built-in tear-strip to make it easier for housewife to open package.)**

**2. Boasts an adhesive that will withstand extremely low temperatures.**

**3. Retards MVT to a minimum.**

**4. Provides increased protection against product-quality deterioration and carton damage from moisture and dehydration.**

Additional benefits include assurance that carton's four-color lithographed vignette, ad copy, and food-preparation instructions can't be unintentionally removed or torn from the package. And the permanent seal means there's less danger that carton flaps may open due to rough handling or seal-fracture occurring from low temperatures.

Manufacturer's tests show that the adhesive is impervious to temperatures down to —100F. It is ready-to-use, requires no pre-heating or mixing, and costs less (33¢ to 35¢ per lb. on national availability basis).

Surface coverage is said to be roughly equivalent to other adhesives. Carton's use is also proposed for "wet" foods or fruits in syrup.

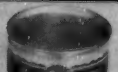
Developer of the 3-phase program —that involves adhesive, paperboard, and conversion attachment— is Ace Carton, Chicago. The carton-sealing approach consists of tailor-made paperboard cartons that are compatible with specially developed wax and adhesive, together with a conversion section engineered for attachment to cartoning machines. (Chet's employs a modified Container Equipment unit.)

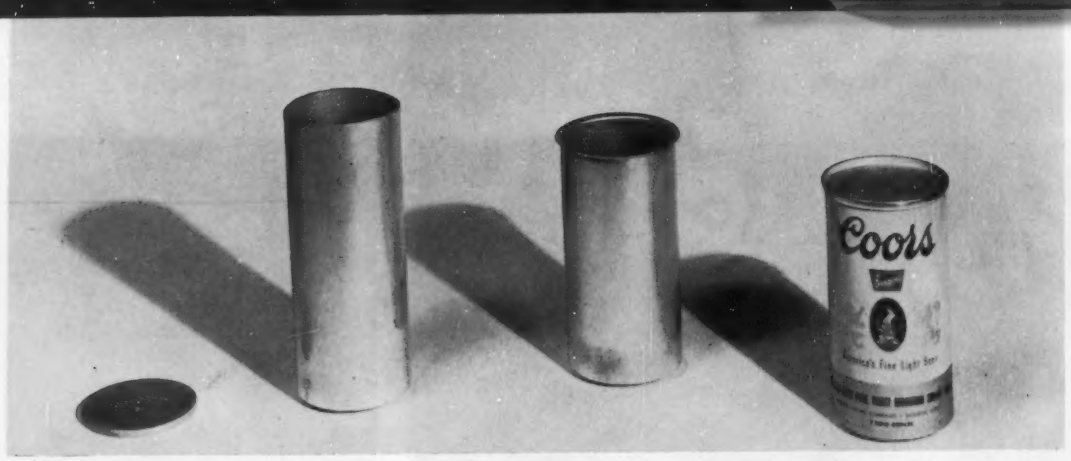
Cartoner opens and squares the boxes. Then, after filling, it meter-applies with rollers the adhesive in register pattern to length and end flaps. Filled, closed cartons are discharged from this unit in continuous flow to the conversion sections. There are four sealing sections, each 3 ft. long. Temperature is adjustable with individual controls. The controls are also regulated for carton size and speed through the machine.

Cartons then move into the air-cooling sections, where blowers precool and further seal the flaps prior to entry into the refrigerated area. In this final section, the carton is quenched to prevent top and bottom panel seal defacement—as well as to avoid burn-back of the wax—by refrigerated plates maintained at 29-31F. Sealed cartons are then hand-cased.

At Chet's, 3 or 4 operators are required for the cartoner, which is run at a rate of 50-60 cartons/min. Rated capacity of unit is 22-72/min. This represents a big cost saving, since the previous over-wrapper, manned by 7 or 8 girls, knocked out only 40 boxes/min. **—FE Staff**








**BEER CAN** is stamped out from aluminum slug (far left). Also shown are blanked-out can body, trimmed and flanged cylinder, lithographed can.

# Aluminum Cans—Ready to Roll?

**With trials of new containers set for this month, there's renewed interest in 'miracle metal' . . . Body-forming improvements bring commercial use nearer, but costs remain vexing problem**

AFTER FALSE STARTS and considerable pie-in-the-sky talk, aluminum cans now seem on the verge of their long-awaited shakedown.

Hopes for the lightweight can's future in the food industry thus remain bright, despite the fact that some of the glitter meanwhile has been rubbed off by the hard knowledge of day-to-day production and handling problems.

As the tinless containers near their baptism of fire, indications are that before 1960 you'll know whether aluminum cans: (1) Will find the mass market in our industry that their supporters are aiming for, or (2) will tend, instead, toward primary use in the specialty container field, where higher package costs are offset by certain marketing advantages.

Now for the new can's latest strides—

**1. In-store appearance this month of the first processed food products in the lightweight cans.**

Among them: Beer (by Hawaii Brewing), cheddar club cheese (Kraft), and filleted sardines in barbecue sauce (Franco-Italian Packing). And waiting in the wings are: Beer (by Coors), canned meats (by an East Coast packer), a second sardine product (by a New England specialty firm), grated cheese (Kraft), and a citrus juice concentrate.

**2. Stepped-up research tempo by suppliers that eliminates some of the forming and handling bugs.**

**THAYER C. TAYLOR**
*Associate Editor, "Food Engineering"*

Aluminum firms have been pressed by sharply increased output capacity (up 75% from 1,151,750 tons in '52 to an estimated 2,026,500 tons in '58), a stubborn oversupply that's hung on since mid-'56, and a saturated military stockpile. Accordingly, they are driving hard to get a foothold in the lush 40-billion-unit can market.

Paced by Kaiser, Reynolds, and Aluminum International, they're pushing hard to get aluminum-packed foods on-stream, if only in small dribbles (Kraft's 5.5-million-unit order is the biggest to date).

**3. Significant breakthrough in conversion techniques that open way to faster fabrication speeds and lower cost (still biggest roadblock in way of any large-scale switch).**

## Speeds Get Competitive

In the works right now is a completely automatic impact extrusion process, by Aluminum International, that company claims may eventually form aluminum cans at an impressive 400-800/min. clip.

The rate, if achieved, would be competitive with tin cans—where body-forming for the average food container is at a 450/min. rate, and at somewhat higher speeds for single-size beer (500/min.) and tuna fish (750/min.) tins.

From the food manufacturer's standpoint, the following factors are seen pepping up interest:

**1. Competition within the food industry.**

Packaging leadership being the potent marketing force that it is, as soon as the trickle of aluminum cans begins to swell, more and more firms will get into the swim—if only out of fear of letting rivals pull off a packaging-merchandising "first."

**2. Possibilities of a completely automatic in-plant packaging line—container-forming to case-packing.**

Two brewers have already installed in their own plants impact extrusion assemblies that will stamp out beer cans from aluminum disks. Since a line like this costs substantially less than a tin-can forming line ($300,000 to $500,000 vs. $1,000,000 or more for tinplate), it's an attractive lure to those packers who have long wanted to make their own containers (at least 12 food firms make their own tin cans at present).

However, a good-sized market has to be developed before can-making becomes profitable for the food packer. Kaiser believes that a food firm would have to move 20-25 million units a year to make its

**TWO TYPES:** Impact extruded aluminum can for beer, shallow drawn for sardines and cheese. Unwrapped sardine can has pull-tab for easy opening.

can-forming assembly worthwhile.

Contacted by FE last month, supplier firms were in almost unanimous agreement that price reductions for aluminum ingot and improvements in body-forming have brought aluminum food cans much closer to commercial realization. As if in direct confirmation of this optimism, two processed foods and a beverage packed in aluminum neared their market debut this month.

Kraft is unveiling cheddar cheese in an 8-oz. drawn 108x312 aluminum can (made by Kaiser Aluminum & Chemical from sheet stock). The container replaces a 4-piece canister (fiberboard body, metal bottom, slip cover, and foil liner and overseal).

Reasons for the switch, Kraft says, are that the new can almost doubles product shelf-life, cuts handling operations at the filler, and has greater merchandising appeal (5-color lithography with inside and outside gold-lacquer).

Containers (shipped 420/case) are dumped onto an unscrambler for single-file conveyor feeding to single-spout, volumetric filler (Kraft's own design). They are then check-weighed and drum-head heat-sealed, with cover applied by hand.

Kraft says filling speeds are the same as with the previous package. Costs and shipping weight are about the same, Kraft adds, but the aluminum cans' smaller diameter cuts down on cube space in shipping.

Franco's aluminum sardine cans, also the drawn type, are die-press fabricated by American Can from .012 in gage sheets. The container holds 6½ oz., compared to 8-oz. for previously used tin can, a size modification probably taken to compensate for the new unit's admitted higher cost.

Company officials say the lighter can saves 2 lb. per 24-unit case. This averages out to 3.6¢ per case, they add, which approximates a month's storage charge per case.

The oblong aluminum cans are 4-color lithographed. Narrow paper labels are hand-applied along the sides after filling.

Surface lithography and ease of opening should attract consumer sales, according to Vice-President Henry Abst. "You can open it with a knife," he adds.

Some in-plant changes had to be made to accommodate the new container. New washers, labelers, and sealers (for the plain cellophane overwraps) were installed.

Packing of the cans is now underway. As for marketing support, a $100,000 promotion blast is slated for around mid-January. Reason for the timing is to first make sure the distribution pipe lines are filled.

Aluminum canned beer by Hawaii Brewing (see FE Sept., p. 82) is expected to go on production lines this month. HB will turn out 24,000 cans daily at first, eventually hopes to market 60% of its beer in this type container.

## Developments Pushed

Behind this growing trickle of aluminum cans is the stepped-up research by metal producers. Spurring them on is the realization that a workable aluminum can gives them best opportunity to date to break the shackles of a "job-shop" status and concentrate on a mass outlet where large volumes of a standardized product open avenues to cost reductions.

Speaking at last month's Packaging Institute meeting in Chicago, L. R. Payton, Reynolds Metals, put it this way:

**"The can market represents one of the first opportunities to achieve new standards of low-conversion cost for aluminum can-making materials, such as sheet and slugs, through high-speed integrated production of very narrow specifications which are especially well-suited for cans."**

Another reason why the can market now looks so attractive to aluminum suppliers is the rapid expansion of industry capacity. Between '52 and '56, estimated plant capacity boomed 54%—from 1,151,750 tons to 1,753,500 tons.

By June 30, 1960, the industry's capacity is seen hitting 2,604,750 tons—a 48% gain over '56 levels.

A prime target in pilot-plant projects has been to bring forming speeds competitive with tinplate. Right now, supporters of the impact-extrusion process claim they're nearest to accomplishing this.

A technique developed by Aluminum International reportedly will fabricate—as well as trim, flange, degrease, coat, and decorate—at a very impressive clip, with each step carried out automatically. Here's how AI's completely integrated line will work at Coors:

Pig aluminum (100 or 2S) is converted into extrudable slugs (of 2.460-in. dia. and .140-in. thick) on a casting line. At the same time, aluminum strip is continuously cast and rolled into lid stock to make the can covers.

Slugs are reverse impact extruded by a 400-ton horizontal press and blanked-out can bodies are trimmed and flanged, then fed to the washer and to unit that mildly etches surface for coatings. Next, cans proceed to a printer or decorating machine. Here, one-pass decorating is followed by application of a finishing varnish. Cans then go through drying oven that sets the coating. From here, they go to the internal coater, then to drying oven for setting.

Finished cans are then automatically conveyed to the filling line, where, in order, they proceed through rinser, filler, and closer. After this, a vacuum dryer removes excess moisture from the can's outside surface. Final steps include check-weighing and case-packing.

A line like this brings several advantages to food and beverage processors, according to Jack Porterfield, AI's chief engineer. For example, the packer doesn't have to bother with unloading and storing cans. Also, the slugs take up con-

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siderably less warehouse space, and can be fabricated at a rate to meet production-line demands.

However, others maintain that more than one manufacturing line is needed to keep up with today's high-speed fillers—thus adding to investment costs.

Porterfield makes a strong case for impact extrusion, terming it more economical than other forming techniques.

"In the first place," he reasons, "material for cans that are drawn or (conventionally) fabricated has to be rolled down to the thickness of the can bottom or can walls. But impact-extrusion slugs only require rolling down to the thickness required for the volume of metal it takes to make the can.

"For a 12-oz. can, this means rolling down to approximately .140 in., as against .020 to .010 in. for the other two types. Rolling and re-rolling is expensive."

Tooling costs are lower with impact extrusion, Porterfield adds. "Impact extrusion gives you more trouble-free operation and much higher speeds. Drawing and ironing at high speeds require constant tool dressing."

Other sources point out that the slug from which most of the can weight is formed is a cheaper form of aluminum than sheet. Also, that investment-to-capacity relationship compares favorably with conventional can-making equipment.

Several variations of the impact-extrusion process are now under investigation.

One method calls for producing multiple can bodies from a single extrusion shell. After extrusion, the shell would receive multiple labels, then be slit on a trimmer into as many as five can bodies.

Seamless square cans are another possibility, Payton adds. These would bring about cube and tare savings. And, he points out, closing machines are available which will handle 250 square cans/min.

Impact extrusion is also being used by Victor Metal Products for the production of aluminum aerosol cans. One innovation in the Victor process is the use of hexagonal slugs instead of the conventional round disks. President Victor Muscat holds that the six-sided slug gives 20% more yield

Impact extrusion is not without its challengers. Skeptics feel that cans made this way have extra thick bottoms (which wastes metal), need extra washing (because lubricating oil from the press may be ground into the can body), and have less surface gloss.

Porterfield concedes that drawing, a second technique that looks commercially feasible for food containers, eats up less metal. But, he insists, these savings are offset by the extra expense of sheet rolling.

Like impact extrusion, drawing lends itself to several variations. The shallow-draw method (ideal for small containers) forms cans with a height up to about one-half of the diameter, is being used for sardines and will also be employed for potted meats.

To get around this height-to-diameter limitation, Kaiser and others have perfected a drawing and ironing process. Forming rates are around 100/min.

Some see a shortcoming in both impact extrusion and drawing because of the failure to take advantage of high-speed flat-sheet roller coating or offset lithography. But decorating multiple can bodies from a single extruded shell offers possibilities here.

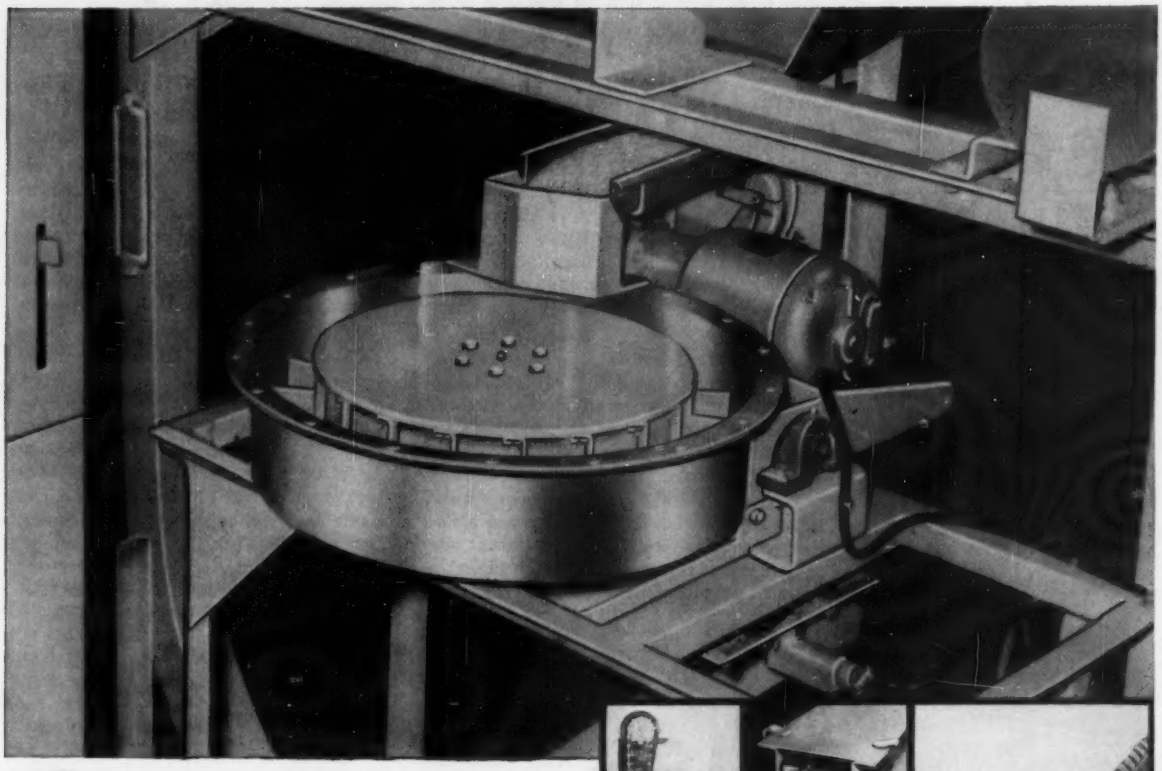
Accordingly, suppliers have experimented with 3-piece side-seam cemented aluminum cans that take advantage of the economies of flat-sheet roller coating. If such a can becomes practical for the food industry, it would have the further cost-influencing advantage of requiring only a slight modification in existing, high-cost can-making equipment.

The 3-piece unit is the type of can involved in the much publicized Esso-Reynolds deal. The aluminum firm feels it could be suitable for such food products as citrus juice concentrates and frozen soups. But American Can's Research V.-P. R. H. Lueck warns that cemented side-seam cans won't work for products requiring internal vacuum (such as coffee) or pressures (carbonated beverages).

Before the 3-piece aluminum can becomes practical for the food industry, the metal's lack of solderability will have to be overcome (since it's the fast-soldering quality of tinplate that permits high-speed fabrication). Possible solutions may lie in the direction of high frequency electrical side-seam welding, or cold (or pressure) welded side seams.

Actual production work with the 3-piece can (forming rate: 750/min.) has led to solutions to several of the handling problems.

For example, fabricators now get around the metal's fairly high coefficient of friction by either (1)



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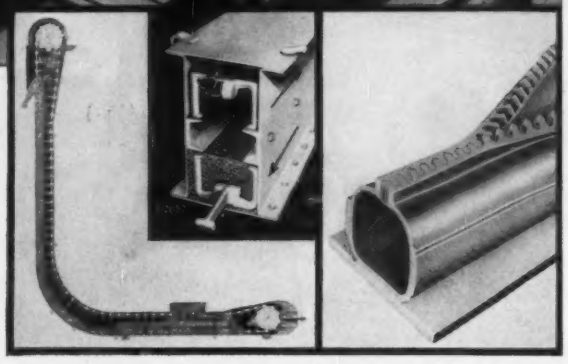

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applying a special coating prior to body-forming, or (2) installing low friction materials (such as berrylium bronze and Teflon) at critical contact points.

At the filling plant level, the metal's non-magnetism has been overcome with mechanical and vacuum devices. And slope of gravity type conveyors has been increased to compensate for aluminum's lightness.

## Any Favorite Method?

While conventional can fabrication, impact extrusion, and drawing techniques each have their supporters, informed opinion feels it's still too early to predict which process will be best in the manufacture of food containers.

Aluminium Limited believes that "The deep drawing process may, in the long run, turn out to be the best method due to the likelihood of producing cans with less metal content than by impact extrusion."

Another leading supplier, believing "it isn't possible to commercially solder or weld aluminum," observes that "a shallow or deep-drawn can is the type which will contain processed foods that require retorting."

Taking an opposite track, a third supplier says "it's possible that technical improvements will make feasible low-cost, three-piece aluminum cans."

## What About Costs?

Along with fabrication rates, costs are freely cited as the second major roadblock. But there's also widespread agreement that the cost differential between the lighter metal and tinplate is narrowing—and so much so that instances of "competitively priced" aluminum can types have already been quoted. Of course, a price that's "competitive" to a supplier may not seem so to the user who is more sensitive to the dollars-and-cents costs of his own operation.

Nevertheless, Aluminium Limited for example, says that: "It appears possible to produce a one-piece impact-extruded aluminum aerosol can at a competitive price with the two-piece drawn-steel can in sizes at least up to 6 oz." And Porterfield says his firm can form up to, and including, 12-oz. beer cans competitive with the conventional tinplate version.

This past summer, Victor Metal Products quoted prices of 6-oz. alu-


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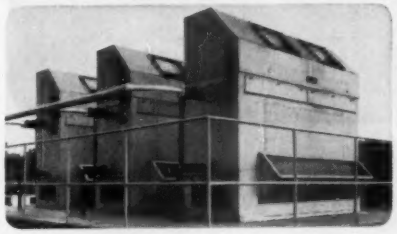

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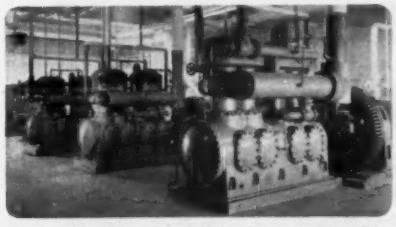

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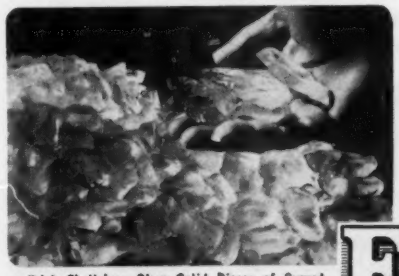

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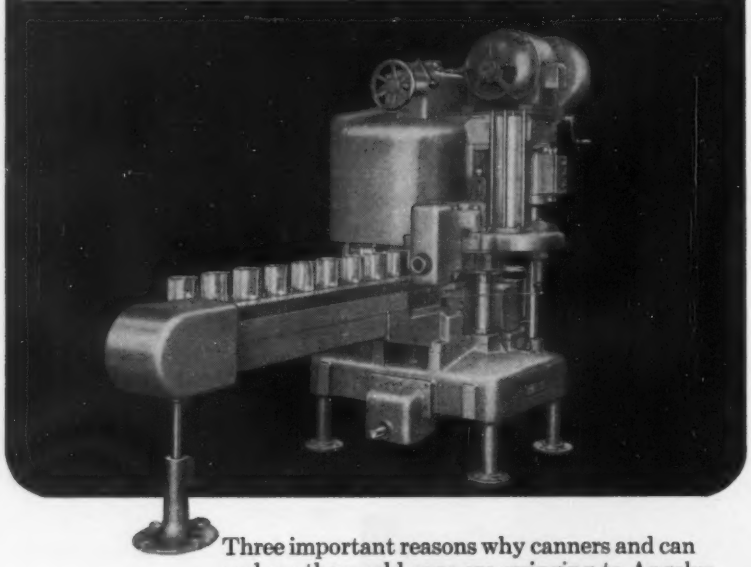

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minum aerosols at $45/1,000 on orders of 2 million or more (and $50/1,000 for lesser quantities). President Muscat asserts this makes his container 2.3% cheaper than the similar type tin container.

Improvements in alloys, Kaiser feels, have made aluminum more competitive "by making it possible to substitute the lighter metal on a gage-for-gage basis with tinplate."

According to Alcoa, it's still too early to make a fair cost comparison. This firm reasons that "cost is very strongly influenced by volume, and aluminum cans have never yet been produced in comparable volume to tin cans. This makes any comparison at the moment pure guesswork."

For the record, tinplate currently is around 9¢/lb. Compared to this, aluminum sheet is about 37½¢/lb., and pig aluminum is 26¢/lb.

A pound of aluminum will give three times as many cans as will a pound of tinplate. However, the softer metal lacks the rigidity and strength of tinplate, so gage thicknesses have to be increased about 25% to 27%. Based on this, one maker of conventional cans estimates that aluminum sheet will have to drop to 21-26¢/lb. before it will be directly competitive.

One container-industry source insists that even where conversion rates for aluminum rival those of tinplate, starting material costs for the lighter metal would keep it from being competitive. He says, 1,000 beer cans made from aluminum slugs would cost $11.30 more than the same number made from tinplate. Of this difference, $11.06 would be represented by starting material costs (24¢ by conversion).

While aluminum has already made some gains in narrowing the price spread, tin can makers are also moving to keep their costs down. For example, Canco's new coil-strip method of making cans is said to indicate important savings in raw material costs.

Equally significant is the matter of price policy. At least one can maker is pegging future price increases (effective Nov. 1) to the labor and material costs of each individual can style. This abandonment of flat across-the-board hikes means that the bigger-volume standard type units will not advance in price as fast as the smaller-volume unusual-size containers. The effect of this move might make aluminum more competitive with the specialty type tin cans but less competitive with the standard type units. —End


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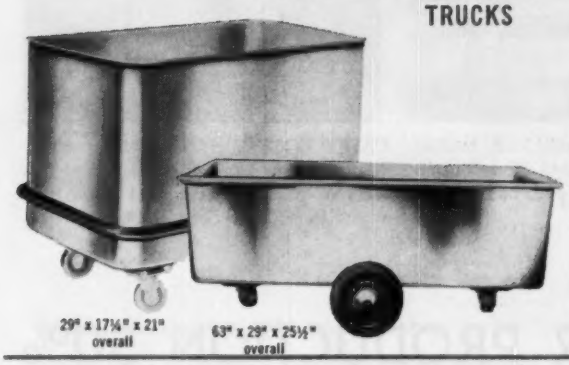

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22⅛" x 20½" x 6½"

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45" and 53"

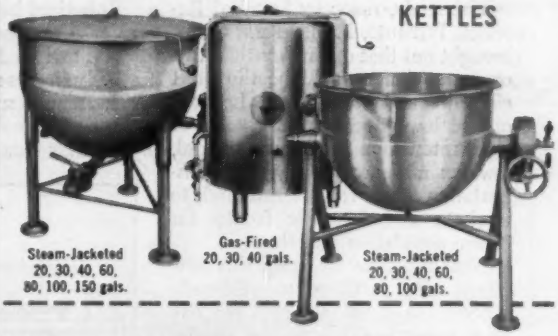
16, 21, 48, 63, 74, 122 qts.

18, 24, 32, 48 ozs.

10, 12, 14, 16 qts.

2 qts.

## KETTLES



Steam-Jacketed 20, 30, 40, 60, 80, 100, 150 gals.

Gas-Fired 20, 30, 40 gals.

Steam-Jacketed 20, 30, 40, 60, 80, 100 gals.

Now you can speed production, and simplify your handling or storage problems with standard, readily available Wear-Ever plant service items like these.

Wear-Ever's complete line of handling, storage and service equipment is constructed from specially developed, tough, hard-wrought aluminum alloys to assure longer life.

Send for your free copy of our new catalog showing the complete Wear-Ever line.

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NAME_____

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COMPANY_____

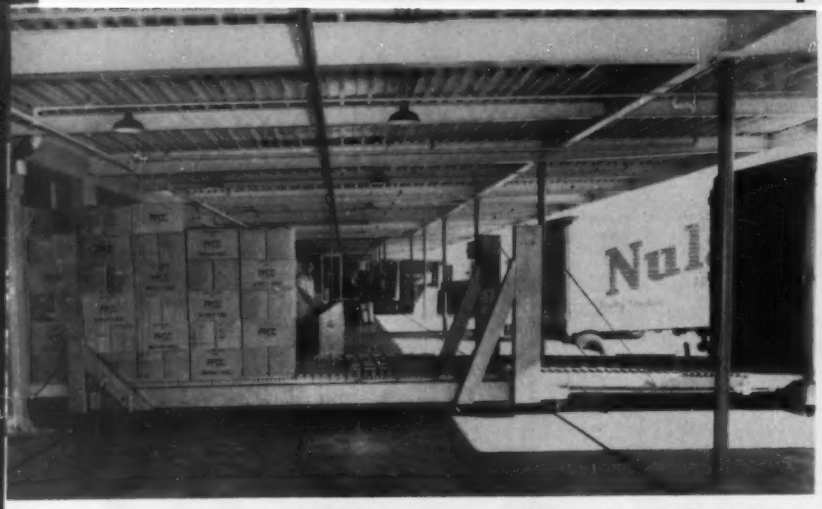
STREET_____

CITY_____ ZONE____ STATE_____

Wear-Ever

**WEAR·EVER ALUMINUM, INC., FOOD SERVICE EQUIPMENT DIVISION, NEW KENSINGTON, PA.**

City_____State_____



**MOBILE DOCK-CARRIAGE** transfers truck-load, or 12 pallet-loads totaling 432 cases, to in-cooler conveyors in 3½ to 4½ min. Truck floors are roller-conveyorized. Loads are pulled from trucks by winch. Carriage is push button operated. It travels sidewise along dock on rail.

**CASED EGGS** enter cooler-storage on conveyors and are manually transferred to flow racks or pallets. Empty-pallet return conveyors from depalletizers are within reach.

# BOOSTS MAN-HOUR PRODUCTION 50%

BETTER THAN A 50% GAIN in production per man-hour—that's the result achieved by Poultry Producers of Central California in its new San Leandro, Calif., plant.

This impressive achievement culminates a carefully designed program. A program that, when all studies were completed, dictated the abolishment of eight egg processing plants and two distributing plants and the consolidation of their facilities in one large, modern facility.

The study, made by Stanford Research Institute, Menlo Park, Calif., brought out that one rather than two or more plants would be the most efficient and that San Leandro offered lower location costs (cost of land, interest on investment in land, low tax rate); reasonably low transportation costs from farms and to markets; and favorable factors for future population growth.

Next step was to equip this new plant with facilities to efficiently process the 2,000,000 eggs per day then being handled by the smaller plants.

## Outstanding Handling

Most noteworthy in this new plant is its materials handling system, for both the fragile product and its containers. Here, design was entrusted to Food Machinery & Chemical Corp., Riverside, Calif.

The candling and cartoning of eggs presented no difficulty, since the plans included the initial installation of nine FMC egg machines. PPCC had already tested this machine at its Modesto and Sacramento plants and so was familiar with its operation (FE,Sept.'54,p.44).

The plant is divided into two sections. One is refrigerated (47 deg. F.) and maintained at 80% R.H. for the temporary storage of both incoming and outgoing eggs. The other is the egg processing and packaging section. It is air conditioned for employee comfort.

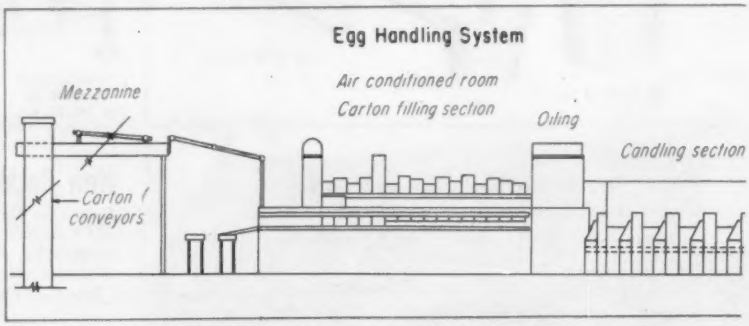
Robotized handling achieves these major advantages:

1. Provides FIFO control.
2. Improves man-hour production.
3. Assures smooth, constant flow at high-volume.
4. Cuts down breakage.
5. Reduces refrigerating costs.

The product is handled manually only three times in this highly mechanized plant: In candling, in casing after automatic cartoning, and finally in loading cases into delivery trucks. The one exception to this is an additional fourth handling of outgoing slow moving items.

The floor of the refrigerated storage room is literally carpeted with roller-conveyors. Shipments from producer-members are unloaded by the truck-load, in one operation, by the mobile dock-carriage operated by one or two men. This requires less than 5 min., whereas manual unloading took 30-45 min. per truck.

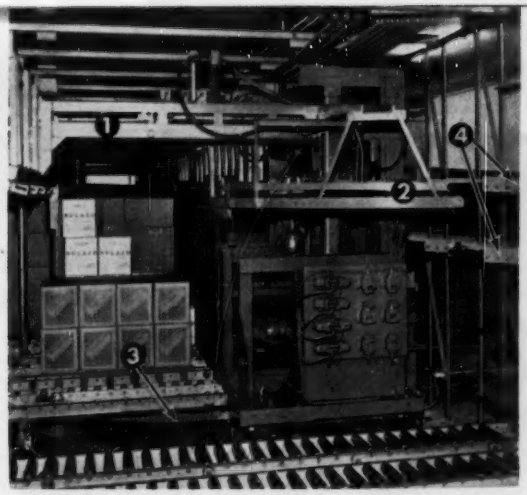
In action, one operator positions the carriage properly with the truck.



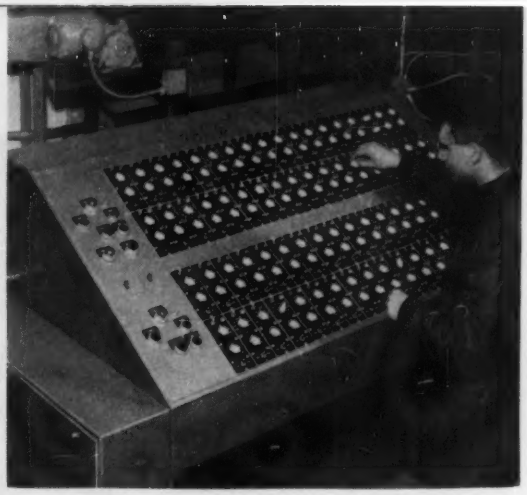

**SIDE VIEW** of mechanized egg-handling system. Candling-packaging section (left) supplies cased eggs to flow racks (slow-moving items) and to automatic order-picking lines via pallet conveyors and unloaders. (See diagram p. 78.)

Order-picking lines are composed of 36 double-decked, gravity roller conveyors. These discharge cased products to double-decked belt-conveyors (1) and (2) on demand from orders setup by operator at the console.

Example: Operator sets up order by pushbuttons. For delivery of a case,




**DEPALLETIZER** is composed of boom (1), powered conveyor (2), and fork-lift (3). When an order-picking line (4) is depleted, depalletizer stops, forks elevate pallet-load (left) to boom. Suction-cups pick up 3-cases.



**CONSOLE OPERATOR** sets up desired quantity of cases by grade-selector switches, which actuate case movement from any of 72 order-picking lines. He presses re-set and start buttons and cases begin to move out of order-packing lines.

## Combines eight plants into one highly mechanized, centralized operation. New materials handling methods are key to volume production

Then he lowers the conveyor-boom, and the palletized load is pulled from the truck onto the carriage. The operator then moves the carriage to a selected incoming-pallet line, and the load is moved off it by its powered conveyor-rolls. A fork-lift truck moves pallet-loads from this incoming-pallet conveyor to the candling stations.

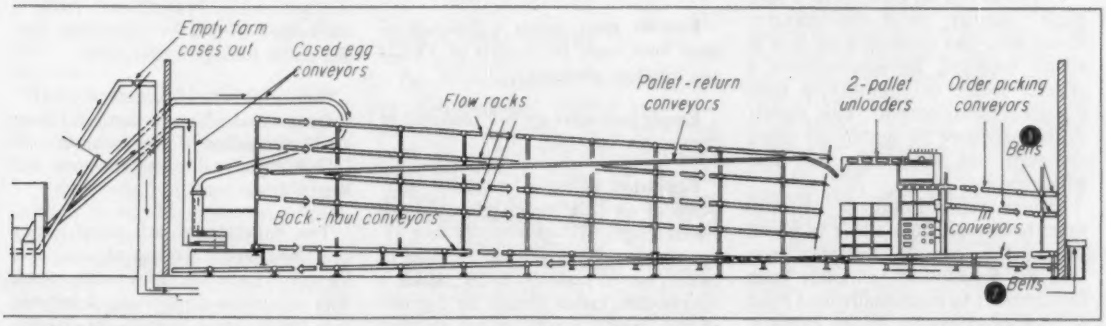
After candling and cartoning, the eggs are packed in retail cases, principally corrugated 15-doz.-size. From casing, the product moves rapidly by belt and roller-conveyors back into the temporary storage room, which is refrigerated and humidified to protect the fresh quality of the eggs.

Retail cases are stored on these conveyors according to grade and, in some cases, by brand. Slower moving items, for example, are stored in the four-tiered flow-racks. Moderately fast moving items are stored on pallets 13x49 in. holding 8 cases. And 24 cases of the fast-moving items are palletized on 37x49 in., flat, veneer board. The automatic depalletizer transfers cases only from palletized lines.

After cases are palletized, they are handled mechanically up to truck-loading stations. Two depalletizers continually patrol their respective, limited areas at the discharge of the palletized lines. These automatically transfer cases from pallets to depleted order-picking lines.

The upper section of a depalletizer is equipped with a boom and powered roller-conveyor. When patrolling its area, the boom and conveyor are elevated in line with the upper order-picking conveyors. After stopping, and locking in position, this section will automatically lower if it is to deliver cases to the lower-level order-picking conveyor. This section is operated by a hydraulic cylinder.

In action, the boom section is in position for discharging cases to the upper order-picking line. The hydraulically operated fork-blades then lift the pallet-load into position. A hydraulically operated carriage, equipped with vacuum cups, then moves out on the boom and engages the upper cases on the pallet. It elevates them, then retracts to posi-




cycle first depresses an air-operated, vertical-lift case-stop at discharge end of this conveyor, and a case moves into take-away conveyor—either (1) or (2). Here it strikes a case-stop reset switch and cycle is repeated or stopped according to operator's order.

Selection of other grades of eggs continues automatically until complete order is filled. Another switch stops it when an order-picking line becomes empty, and automatically performs this cycle: Elevates correct pallet-load to its boom, where vacuum-cups grip three cases and move them on boom-track to its powered roller-conveyor, whereupon this conveys them to empty order-picking line.

Case diverter shunts cases that have been loaded manually on its double-decked conveyors from flow racks to take-away conveyors (1) or (2).

tion the cases over the roller-conveyor. Then the vacuum is released and the cases move to the depleted order-picking line.

When the depleted line has been filled, a switch on the boom actuates a finish relay and the forks return the pallet to its conveyor. And if the boom has been lowered, it rises. A hydraulically operated centering-pin, which locks the depalletizer in position, is then unlocked. This allows the drive motor to be energized and the machine resumes its patrol.

After unloading the last case on a pallet, the forks lift the empty pallet board to a level with the elevated pallet-return conveyor. The hydraulically operated carriage on the boom then moves forward and ejects the pallet onto its conveyor. Then it rolls by gravity back to the manual loading station.

There are 36 double-decked order-picking conveyors—a total of 72 conveyors. All carry different grades of eggs—with the exception of the several lines used for the popular large AA and Extra large A grades.

The console operator has but to set up his order and next press the re-set and start buttons. Then the automatic system takes over and delivers the order to the truck-loaders awaiting on the dock.

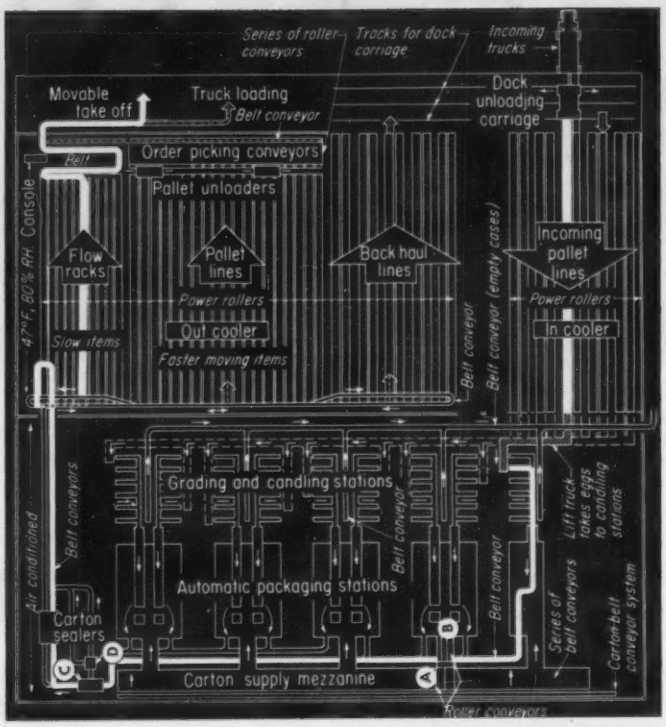
The exception to this is the earlier-mentioned fourth manual handling —necessary to fill orders with the slow-moving items from the flow-racks.

When the quantity set by the console operator has been satisfied from the first order-picking line, the next in sequence away from this station begins to discharge its cases. This continues until an order is completed, which is announced by an indicator light.

If an item of an order is of a very small quantity, or if the operator knows that the order-picking line is nearly depleted, he may actuate a priority switch in conjunction with a grade-selector switch. This signals the depalletizer to ignore all other demands and serve only that line with priority.

When many hundreds of cases must be moved from a line to fill an order, the console operator may lock the depalletizer (remotely from the console) to continually feed from a selected conveyor to its counterpart order-picking line.

Depalletizers are only indirectly controlled at the console. As the order-picking lines empty, the machines automatically stop and refill them. —*End*




## Operation of System—From Receiving to Shipping

**Dock unloading** carriage is propelled on rails by 1-hp. motor. Its two booms are powered by two ½-hp. motors; winch by 1½-hp., and chain-driven, roller conveyors by 1-hp.

**In-cooler** conveyors comprise five double lines (130′ long—plus 4′ 6″ gravity roller conveyors extending into candling room). Capacity is 72 pallets per double-line. 1½-hp. motor drives rollers of each double-conveyor (powered rollers are on 40″ centers) by a reciprocating rod and ratchet mechanism. Each single conveyor is 14½″ wide, all slope 0.1″ per ft.

**Fork-lift** truck moves pallet-loads of filled farm cases to candlers at FMC's egg handling machines.

**Empty farm cases** are belt conveyed to storage-area conveyor.

**Egg-carton** conveyor system is composed of six (22½″-wide) belt conveyors —total length 452′—powered by four 1½-hp. and two ½-hp. motors. Packages of cartons moved manually to (A), which is intermediate carton storage on 5-groups of 12 (each) gravity roller-conveyors. From (A), cases are manually supplied to (B), immediate carton-supply gravity roller conveyors from which operators move cartons to FMC egg machines. There is an (A) and (B) for each package area.

**Packaged eggs** are conveyed to electro-mechanical diverter (C). It routes retail cases to sealers, or diverts returnable farm cases or wood cases to (D), which divides flow to wood-wire station or to returnable intermediate storage conveyor. Another diverter switches cases to one of two elevator-conveyor lines by detecting color spot on case side.

**Flow-racks** (intermediate storage) for slow moving items are 4-tiers high and 100′ long. There are two sections: One has 16 (14½″-wide) conveyors powered by 1-hp. motor; other has 24 (14½″-wide) lines powered by 1½-hp. motor. Power is transmitted to rolls by chains that contact rollers through rubber shoes.

**Out-cooler** section consists of 10 (13″ wide) powered pallet conveyors, 80′ long, for 13x49″ pallets (8-cases each); also, 26 (37x49″) powered pallet conveyors 80′ long (24-cases each).

**Two depalletizers** each patrol respective (fixed limits) sections of pallet-lines on rails. Each has 3-hp. main motor with rack-pinion drive mounted between rails (speed 2-mph.), and 2-hp. vacuum pump.

Each is equipped with fork-lift; a boom designed with suction-cups to pickup cases; and a powered, take-away conveyor that feeds cases to order-picking lines. (See diagram pages 76-77.)

# New Cutter Ups Corn Yield and Quality

**Top-recovery unit includes size gager that distinguishes more mature ears—actuating flip-plate to divert older kernels into separate flow**

**NEW CORN CUTTERS** flank conveyor delivering ears from husking machines. They enable canners to increase recovery, assure more uniform packs.

STAR ACTOR in this year's sweet corn operations in six canneries of the Wisconsin-Minnesota area has been an ingenious new cutter.

At last count, 103 of the units—called the dual-head C-8 TUC by its maker, The United Co.—were being operated by these six plants.

The unit's self-regulating, non-rotating cutting heads automatically and accurately cut (depth-wise) varying ear sizes in a field run and, at the same time, separate kernels into two fractions—(1) the younger and (2) the more mature corn.

Cutter can handle up to 96 ears/min. or 2 tons/hr., with an operator alternately feeding into pockets of each head.

The quality separation works on the principle of maturity (large ears generally are more mature, have bigger, often tougher and darker kernels with more sugar converted to starch). Through in-process measurement of ear diameter, kernels are automatically separated into smaller and larger sizes.

## Benefits Cited

**Quality:** Each fraction, whether packed as whole-kernel or cream-style corn, is more uniform in size, color, flavor, texture, and moisture content.

**Increased yield:** While significantly upgrading quality, new cutter also dramatically raises product recovery. Average cases-per-ton of No. 303 can-packs has been stepped up from 30 to 40. Maximum yield with new cutter has been 51½ cases.

**Labor savings:** Ear-grading labor is abolished. Cutter operator's feeding in of ears sets production pace and minimizes work stoppage.

**Flexibility:** Packer can cut each variety as desired. Cutting head is adjusted (by turn-knob) for a uniform cutting-depth throughout.

Cut-depth can be rapidly changed (increments of 0.005 in.) while machine operates. Such finger-tip adjustments may be necessary when canner spots one of his units cutting either too deep or too shallow. It's significant here that a 1/16-in. variation in depth of cut can mean a 20% recovery loss.

Once corn is separated into the two fractions of different maturities, the canner can pack as fancy, extra standard, or standard grades of either whole kernel corn or cream corn.

## How Cutter Works

Machine separator is pre-set for ear diameter and cutting heads are adjusted for depth. Ears conveyed from huskers are then alternately hand-fed into right and left pockets of heads. A pair of pre-set grippers opens to receive an ear and closes to measure its diameter.

When ear is larger than setting, say of 2 1/16-in. dia., a limit switch actuates a solenoid which, in turn, flips a separating blade. Kernels cut from this ear are diverted to one side of split-cut corn conveyor below machine. Smaller ears don't operate separator, so kernels drop into alternate side of divided belt.

Grippers also center the corn so the ear-propelling rod engages it in dead-center for proper feeding into cutting head. Accurate, sharp cutting is assured by the specially designed ear-conveying rod. Its forward speed is half that of its retracting movement, and half that of the free-moving, low-pressure spring contacts of the sensitive cutting head.

Sensitivity of the spring is one-third that of the former TUC cutter, hence maximum cut-depth regulation is achieved. Too deep a kernel cut would adversely affect quality, particularly when all oil-containing embryo is included.

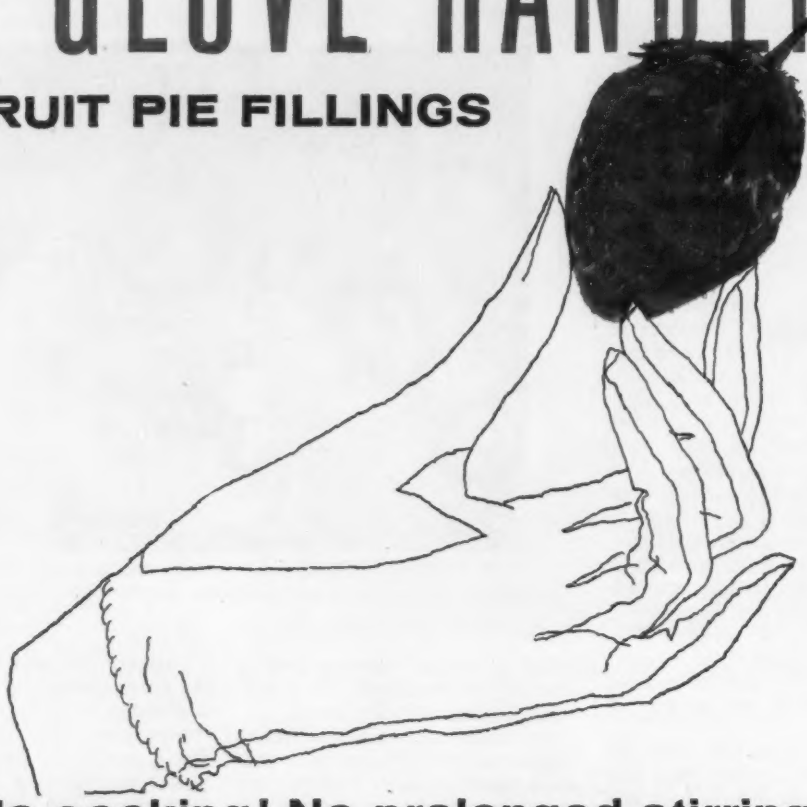
Cut-depth regulating gages are only ⅛ in. from the six cutting knives arranged in camera-shutter fashion. This way, they reflect true ear diameter at operating point of knives. And they're smooth and gently tapered for easy entry of either normal or blunt ears. Ear shape and size control in-and-out movement of angular knife blades.

Canneries using the new cutters in Wisconsin are: American Stores Dairy Co., Fairwater (14 cutters); Monarch Foods, Cambria (26); Fall River Canning Co., Fall River (20); Shawano Canning Co., Clintonville (9); and Pardeeville Canning Co., Pardeeville (10). The Minnesota facility using them is Lakeside Packing Co., Lakeside (24). —End

**JOHN V. ZIEMBA**
*Associate Editor, "Food Engineering"*

# KID GLOVE HANDLING

## FOR FRUIT PIE FILLINGS



**No cooking! No prolonged stirring!**

INSTANT CLEARJEL handles fruit gently. It eliminates the prolonged stirring and cooking in steam kettles that cause fruit breakup.

INSTANT CLEARJEL makes glorious fillings. It is a special cold swelling starch that gives cooked starch body at room temperature. It greatly simplifies preparation. Usual procedure: Mix dry ingredients. Add water or juice. Agitate. Finally, fold in fruit and bake. A worthwhile savings in time, labor, fuel.

INSTANT CLEARJEL offers everything to make fruit pies tastier. Exceptional clarity. Sparkling color. Smooth texture. *PLUS* kid glove handling for fragile fruit. Why not bake a test pie? We'll gladly send a sample, more information and suggested formulas.

NOW AVAILABLE FROM YOUR BAKERY SUPPLY HOUSE

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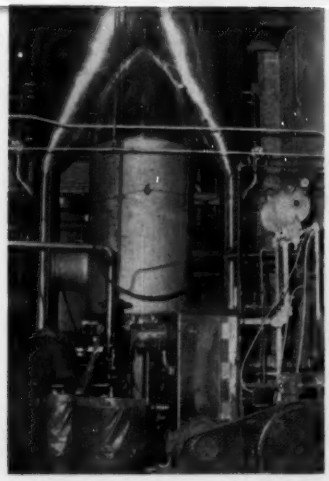
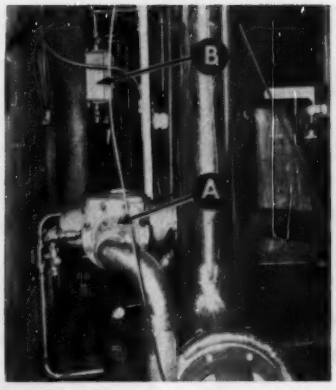
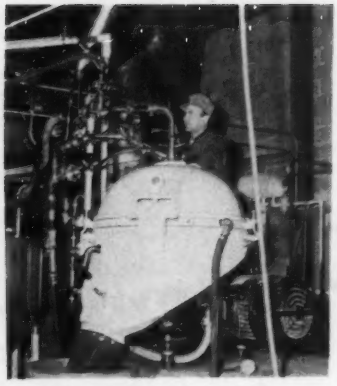


**FINISHING EVAPORATOR** is hooked to double-effect unit for continuously concentrating grape juice from 15.5 to 72 Brix.




**ACCURAY** controls density. Measuring head is at (A), pre-amplifier at (B).



**CENTRIFUGE** continuously separates tartrates at rate of 800 gph.

# Improves Concentrating 3 Ways

**Concentrates juice in one pass to 72 Brix. Controls density by nuclear technique. Removes tartrates while processing**

TAKE A DOUBLE-EFFECT that's been concentrating clarified grape juice from 15.5 to 45.0 Brix. Hook it up to a brand-new finishing evaporator—a second double-effect Mojonnier. And now you're really in business concentrating the juice, in a single pass, from 15.5 to 72.0 Brix.

Now install a radioisotope gaging system (AccuRay) for continuously measuring and controlling product density. What you'll get are sharper tolerances (±0.5%).

Next run your concentrate through a 4,500-rpm. centrifuge (Westfalia) and you'll accomplish something that's never been done before—remove tartrates while processing.

Conventional practice is to cold-store (about 28 F.) for several months and then to "rack off" the juice.

Anyone make such changeovers? A. F. Murch Co. did on its combination juice-concentrating and essence-recovery installation at Paw Paw, Mich. (FE Dec. '57, p. 90). For Murch's 450-ton-per-day grape operation there's also been a handsome payoff by—

. . . **Reducing shipping weight (to 1/5th) and cost.** It now ships 1 carload of concentrate in place of 5 of single-strength juice.

. . . **Saving container costs.** Higher-density concentrate occupies much less volume.

. . . **Lowering refrigeration costs** by continuous tartrate removal.

. . . **Cutting man-hour requirements significantly.**

. . . **Abolishing chance fermentation** whenever concentrates must be cold-stored.

. . . **Providing new possibilities,** such as shipping to distant markets for reconstituting into single-strength juice and concentrating pulp (45 to 50 Brix) for jam makers.

. . . **Permitting new savings by wineries** through 100% use of tank-trucked concentrate at about 1/4th cost of single-strength.

Processing is the same as that previously described last year, except for the following advanced practices (taken up in process order):

1. Electronic level controls (Electromatic Control Co.) were installed in hopper receiving grapes from stemmer.

2. Feeding cellulose pulp to slurry tanks is accomplished automatically by timing delivery of paper sheet from roll stock (300 lb.) through a pair of corrugated rolls supplying a hammermill.

3. Finishing evaporator takes 45 Brix concentrate out of 1st double-effect tubular-type evaporator at rates up to 1,400 gph. through a 20-hp. centrifugal pump. Concentrate—minus esters drawn off in a fractionating column (Mojonnier)—is increased to 72 Brix, and is discharged from finisher at a rate of 800 gph. Entire system handles up to 4,500 gpm. of single-strength juice.

4. An AccuRay density measuring system, operating on principle of radiation absorption (radioactive isotope), is employed to boost accuracy by automatic opening and closing of pneumatically operated valve on discharge line from finishing evaporator.

Measuring head (equipped with source detector) is hooked up with pre-amplifier, instrument and recorder (Bristol). A source of gamma radiation is mounted on one side of a short-section pipe (pass tube), and radiation detector on opposite side of pipe measures amount of radiation through concentrate. Detector converts amount of radiation (dependent upon density) into electrical signal.

5. Separator continuously removes tartrates from final concentrate at an 800-gph. rate. Concentrate is supplied to separator by 10-hp. pump (Creamery Package) hooked up with Reeves variable-speed drive to automatically control flow. Raw tartrates are recovered in polyethylene-lined drums. Clarified concentrate is fed into three vertical cold-wall storage tanks for 50F. cooling. —*End*

**A. F. MURCH and JOHN V. ZIEMBA**

Respectively, Secretary-Treasurer, A.F. Murch Co., and Associate Editor, "Food Engineering"

*Simoniz*
*puts "protection"*
*in a can*

# Packomatic® puts the cans in a case

*Packomatic equipment feeds, forms, positions, loads, seals and imprints corrugated shipping containers automatically.* However you ship—in multi-ply paper bags, or in corrugated shipping containers; whatever you "package"—a can, a carton, a box or a bale—there's a Packomatic machine designed to handle your shipping container requirements. Packomatic machines, geared to your production line, will feed, form, position, load, seal and imprint corrugated containers automatically—or do any of these operations singly as a complement to your existing packaging facilities. Let one of our sales engineers suggest the start of a long-range packaging program for your plant. Investigate the Packomatic method of cutting costs and boosting production. Call, write or wire today.

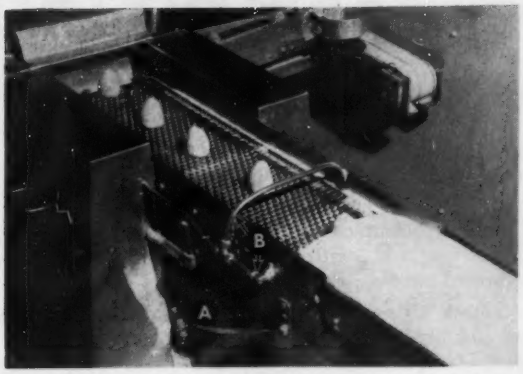
**Fully-automatic Packomatic Case Former-Loader, part of a fully-automated production line at the Simoniz plant, Kankakee, Illinois. Other Packomatics on the Simoniz line include Case Sealers and Case Imprinters.**

**Begin to automate your packaging line with this high-speed, fully-automatic Case Sealer. Aligns loaded cases, positions flaps, glues, seals and discharges — and no operator needed! Available in wide range of sizes. Semi-automatic, too. Call or write for additional information.**

**J. L. FERGUSON CO. Joliet 10, Illinois**

PACKOMATICS include the Bale Sealer • Case Sealers • Opener-Loaders • Case Imprinters • Telescoping Volumetric Fillers • Packer-Gluers • Semi-automatic or fully-automatic.

**CROQUETTE FORMER** delivers uniform product of proper shape and compactness. With two operators it does work of 80 women. Material is emptied into hopper (A), from which auger forces it to dual forming head. Molded croquettes are soaked in batter in cups (B), then conveyed to breader (C). Finally, they move on belt (left) to oven.




**BREADER** employs a turning drum (removed for photo) that picks up croquettes as they drop from conveyor (A), deposits them along with crumbs on top conveyor. Ingenious crumb remover comprises perforated tubes (B) over and under conveyor. Streams of air from these tubes blow excess breading off products and back into drum for re-use.

# Keeps Pace by 'Spot Mechanizing'

**Prepared-food maker automates high-labor points, installs ingenious devices to cut costs and give consumers better, more economical products**

FULL PROCESS AUTOMATION can add up into a project that's quite weighty for the relatively small food operator.

So here at Myers Food, maker of frozen meat pies and chicken croquettes, we decided to take a different approach—*spot mechanization.*

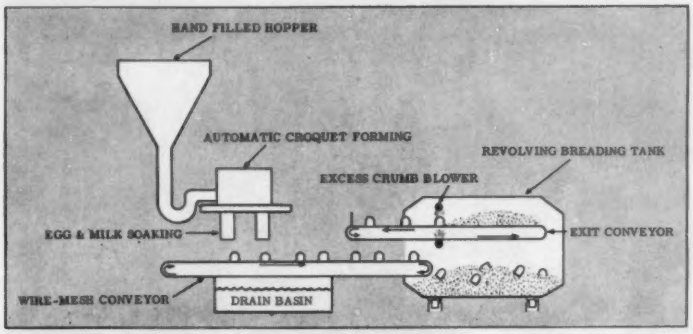
**In short, we didn't try to mechanize a complete product line, but only those "spots" in our operations where costs were highest and the potential volume warranted.**

In surveying our operations, the croquette process seemed to offer the best yield for our investment—for these two reasons:

There are a lot of steps involved—material must be accurately measured, compacted, shaped, soaked, drained, breaded, and cooked.

The future sales curve for chicken croquettes looked very good.

Having neither the labor supply nor the plant space to achieve the manual productive capacity seen necessary to meet the future demand for this product, we installed a single machine that is capable of forming croquettes as fast as a team of 80 hand operators. It requires only two people and fits in a small area (40 x 15 ft.).




**SCHEMATIC** of automatic croquette preparation. No manual labor is employed from time material is filled into hopper until products are cooked and ready for packaging.

Even if we had been able to obtain the required 80 workers, and had expanded our plant to house the operation, it would have been impossible to produce croquettes that were of the same quality and uniformity as the machine-made ones.

Operation of the forming unit is completely automatic once the

**HAROLD F. MYERS,**
President, Myers Food, Inc., Plumsteadville, Pa.

GARDNER DENVER

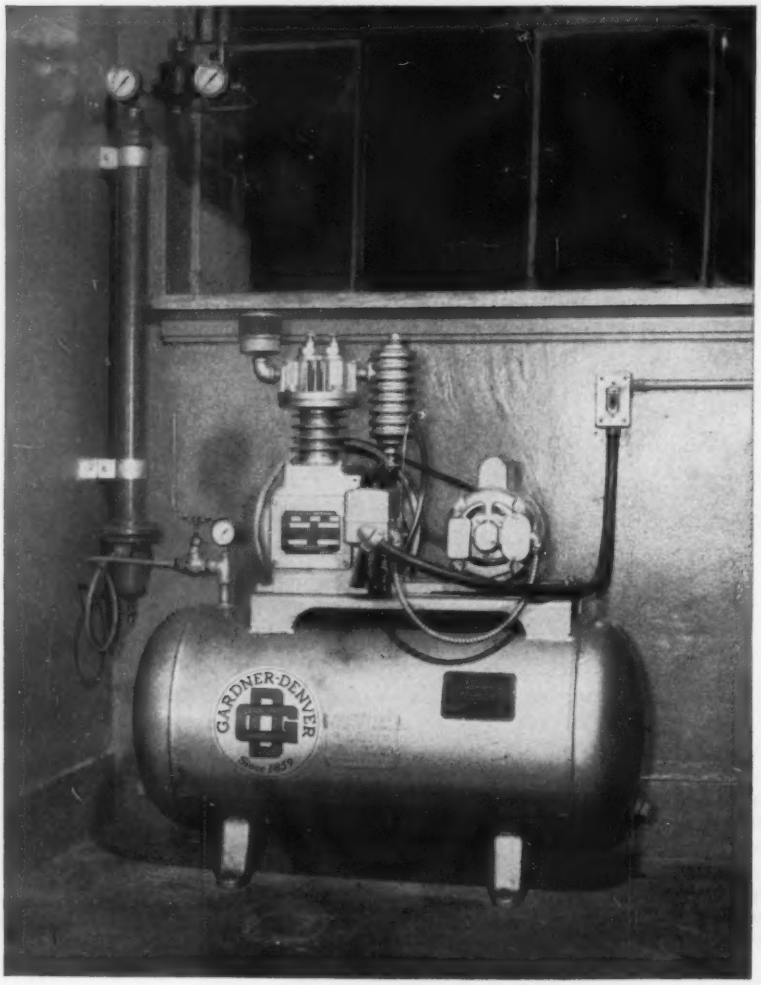
Hook up a small and compact Gardner-Denver CACB compressor and be sure of the pure, oil-free air you need for instrumentation, processing or the manufacture of chemicals.

The CACB uses no oil in the cylinder. Pistons and piston rings are made of self-lubricating carbon—no oil or water lubrication required. This highly efficient compressor supplies four to five cu. ft. of low-cost oil-free air per min., with discharge pressures from 40 to 100 psi. Write for complete information.

Stationary air compressors . . . tank-mounted compressor outfits . . . oil-free air compressors—whatever your compressed air needs, see your Gardner-Denver compressor specialist first. Gardner-Denver Company, Quincy, Illinois.

# Low-cost . . . oil-free air

## Compact CACB compressor






worker fills the machine hopper. A pneumatically controlled auger feeds the material through a U-shaped pipe system into a dual molding head. Here, a carefully metered quantity is formed and pressed into two croquettes at a time. These are deposited into individual chambers, where they are soaked in an egg and milk mixture.

After soaking, croquettes are first conveyed on a wire-mesh belt that moves over a receiving tank into which excess egg and milk mixture drains. Then they drop into a rotating breading tank. Here, they are coated and deposited on another conveyor, along with a considerable excess of crumbs.

The excess crumbs are removed by a special "crumb-blower." The unit comprises two copper tubes with a series of orifices that direct air onto the breaded croquettes from both above and below the conveyor. This action, inside the breading tank, insures recovery of excess crumbs.

### Tray Dispenser

Second target of our spot mechanization was the meat-pie line. At the start of this line, 1-lb. aluminum trays are dispensed from a stack and fed down a slide onto a conveyor belt. As they move along the belt they intercept an electric-eye beam, which causes a measured quantity of gravy to be dispensed into each tray.

From here the trays are loaded into pans and the rest of the process is done by hand. Metering of the exact amount of gravy into each tray maintains the consistently high product quality that our consumers expect.

Consecutively separating the bottom trays from the stack of containers posed a knotty problem. Since tight stacking forms a slight suction inside the trays the use of turning cams alone won't do the job without damage. But we found that by timing an air blast to coincide with the cam action, the suction is broken and the trays are smoothly released onto the elevated feed platform.

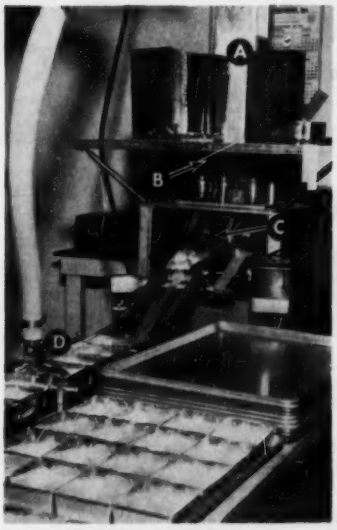
When this platform is lowered so the tray completely clears the stack, another timed air blast slides it off the platform and down a chute to the automatic gravy dispenser.

### Central Pneumatic System

Our central pneumatic system is an essential part of our operation, supplying oil-free process-air for such



For more data, circle 290 on Reader Service Card




**TRAY FEED ON MEAT-PIE LINE,** another labor saver. Timed air blast, directed at lower part of feed magazine (A) releases bottom tray from stack onto platform (B). Then platform retracts and another air blast blows tray onto discharge chute (C). As trays are conveyed from chute, electric-eye-actuated feeder (D) meters desired quantity of gravy into each.

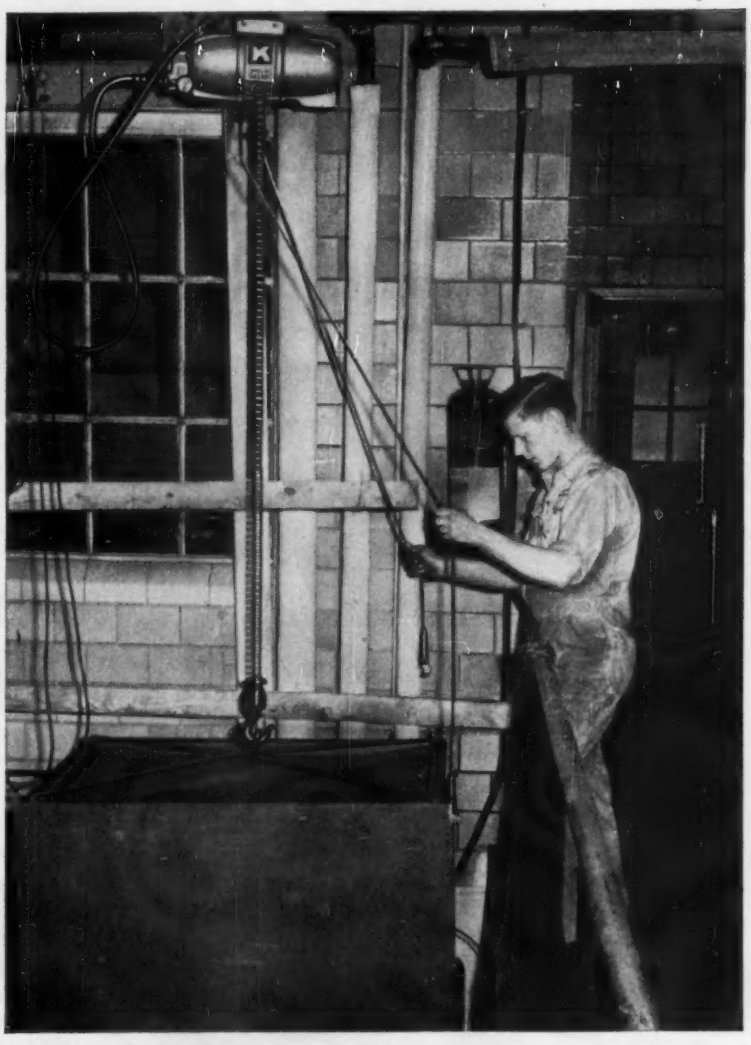
attachments as the crumb-blower and tray dispenser.

Two small single-stage Ingersoll-Rand compressors operate continually to produce the necessary air. No automatic shut-off or unloading devices are used on either the Model N non-lubricated unit or the Model 23A lubricated compressor.

The simple expedient of having an open-end system on both compressors makes controls unnecessary. Any pressure build-up in the system merely increases the volume of air used for crumb blowing or tray positioning.

The system is designed to use the full capacities of the compressors at the present time. But additional capacity—that may be required by new mechanization—can be obtained by changing the motor-to-compressor drive ratio. Higher speed will increase the compressors' output to meet such future demands.

We are continually surveying both our operations and the projected sales curves for each of our products to see where further mechanization will cut costs and enable us to offer better products to the consumers for less money. We feel that this is the way—and the only way—we can compete and grow. —*End*



# Air hoist saves time

## moving loaded meat container

To avoid excessive handling and save time, this plant smokes meats in batches using huge containers. A Keller air hoist provides the quick-stepping lift to move the heavy meat-filled boxes in and out of the smoking room and to the shipping dock.

When you need a lift, remember the Gardner-Denver line of Keller air hoists. They're fast, safe, easy to operate . . . provide accurate control of heaviest loads. Capacities from 150 lb. to two tons. Write for Bulletin 86-1.

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GARDNER DENVER

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario



For more data, circle 291 on Reader Service Card

WASHDOWN HOSE

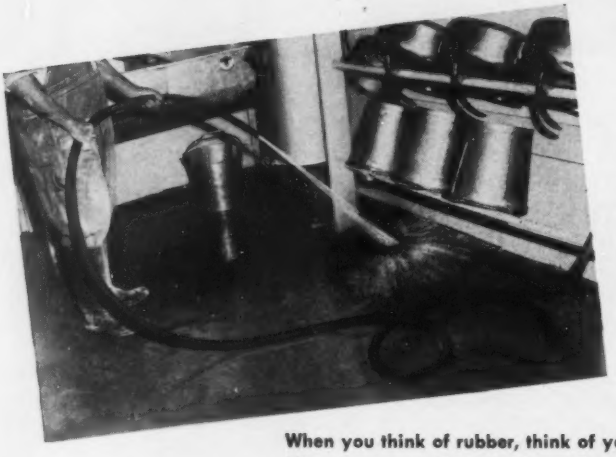
# Washdown hose that's never a washout

## FOR HOT WATER OR LOW-PRESSURE STEAM

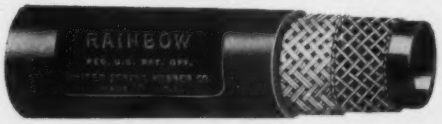
For washing, cleaning and sterilizing equipment, this specially compounded **U. S. RAINBOW® CREAMERY HOSE (STYLE P-455)** has a white, strong and flexible cover, resistant to destructive effects of grease and lactic acid. Nozzle can be built integral to prevent chipping of fragile linings in tanks and sterilizers.

**U. S. PACKER'S WASH-UP (STYLE P-7093)** is very flexible, but very rugged. Four-ply carcass duck assures easy handling, perfect balance. Cover of black neoprene resists destructive action of animal fats, oils, and abrasion.

## FOR COLD OR WARM WATER



**U. S. PEERLESS® WATER HOSE (STYLE P-365)** has a tube of extruded natural rubber to provide a smooth waterway. Carcass of braided rayon for longer life in high-pressure service. Highest grade brown cover is specially compounded for resilience, resistance to abrasion and other abuse.




This attractively priced hose, **U. S. RAINBOW WATER HOSE (STYLE P-340)**, has a carcass of exceptional strength and flexibility, thanks to two braids of high-twist cabled rayon. Tough rubber cover resists abrasion from dragging or scuffing. Seamless tube of special rubber stock.

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Mechanical Goods Division

**United States Rubber**

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

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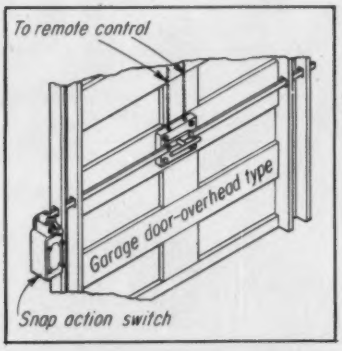
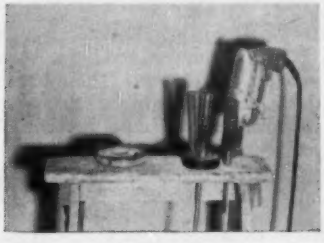



### Tell-Tale Switch On Casing Warns of Open Door

Many plants have motor operated, remotely controlled overhead garage doors. These doors are sometimes carelessly left open, thus reducing plant security and, also, causing excessive heat losses in cold weather.

Here's a novel way to prevent this from happening. Just install a 2-pole, single throw, normally-closed snap action switch on the door frame at the point where locking bars extend through it (see drawing). Connect this switch with a buzzer in the watchman's office and a warning light on the desk of the employee who operates the door control.

When door is in any but a completely closed position, circuit is completed causing buzzer to sound and lamp to be lighted.—*Micro Tips, pub. by Micro Switch, Freeport, Ill.*



### Keeps Tools Handy

Here's a good way to be sure that the tools you are using when working on a step ladder are always readily available.

Just bore holes in the top step of the ladder to fit the various tools—screw drivers, electric drill, hammer, etc.—then be sure to replace each tool when you are finished with it.—*FE Staff.*

## This Sorter Eliminates Manual Cutting, Smooths Out Potato Chip Packaging

Before installing a FMC John Bean sorting machine (photo), it was necessary to use four girls on our potato washing and peeling line. Purpose was to manually cut extra-size spuds into 2-4 pieces when running several chip-frying lines for the 5 and 10¢ bagged items.

Sometimes extra large spuds passed by these girls, resulting in chips that were too large to fill efficiently into mouth of bags. Result: Chip had to be broken to size for manual feeding and weighing. Or the bag had to be taken off the line, emptied of contents and tossed away.

Now, however, manual cutting has been abolished and our packaging line (Woodman) operates more smoothly in bagging the ¾ (5¢) and 1½-oz. (10¢) packs, since we've installed the sorting machine.

Bagged potatoes are hopper-dumped and an inclined flight-conveyor (3x7½ ft.) feeds them to the sorter. Latter has two sections, each comprising three grooved horizontal rollers spaced to grade the potatoes.

Those under 2¼-in. pass through the rollers and are collected in 1,500-lb. wooden pallet bins. These are used for chips to be packaged in ¾- and 1½-oz. bags.

Large potatoes that don't pass through rollers are also collected in pallet boxes and used for chips to be packed into larger size bags or cartons.—*Theodore A. Peszynski, Plant Superintendent, Jays Foods, Inc., Chicago.*

### Easy Waste Disposal

Before installing a modified garbage disposal unit, it was necessary to collect sludge from our seven milk separators and two clarifiers in garbage pails.

The result: Flies congregated in areas outside our plants as the smelly refuse sometimes laid over as long as two days, awaiting pick-up by farmers who fed it to their hogs. What's more, considerable handling and pail clean-up labor was involved.

Now, however, the sludge is removed from separators and clarifiers every 8-hr., and fed to a home-type

For weighing
critical materials . . .

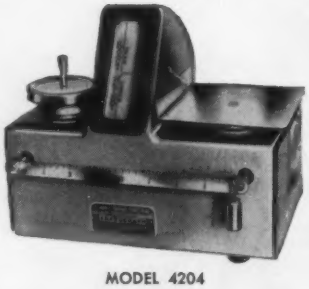
# Accurate readings are easier, faster with SHADOGRAPH®

Critical materials are measured in precise amounts—with accuracy you can read at a glance—on the Shadograph above. Ultra-visible readings are made possible by shadow-edge indication on an illuminated dial. Parallax is impossible . . . friction is eliminated from indication system . . . balance comes to rest more quickly. Model 4202-B, in use above, has capacity of 500 grams and visible sensitivity of 175 milligrams.

Shadographs are made by The Exact Weight Scale Company and backed by more than 40 years of experience in industrial weighing equipment. Write for Form No. 3333.

## SHADOWGRAPH MODELS

For compounding, checkweighing, centrifuge balancing and general laboratory use. Capacities from 2,000 milligrams, with 1 milligram visible sensitivity to 100 lbs. with ¼ ounce visible sensitivity. Avoirdupois or metric dial and beam. Shadographs are available with photocell controls for operating visual and audible signals, or for controlling auxiliary machines or equipment.



MODEL 4204

Exact Weight SCALES

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## *Practical Ideas*

garbage disposal unit (photo). Driven by a ½-hp. motor, unit intermittently grinds about 30 lb. of sludge per 8-hr. shift.

As sludge is ground, water is fed into hopper of disposal unit, flushing the slurry directly into the floor drain. —*Henry Maas, Maintenance-Eng. Supt., Rochester Dairy Cooperative, Rochester, Minn.*

### Bumpers Protect Ducts

Here's how we prevented damage to the air-conditioning ducts in our proof boxes when rolling rackloads of panned doughs in and out of them.

Pairs of steel bumpers were mounted 1 ft. above the floor level along each side of loading and unloading doors (photo). These guide the portable aluminum racks easily and snugly through the boxes without damage to the ducts.

Soon after the bumpers were installed, however, another problem popped up: How to reduce friction between racks and bumpers and thus avoid scratching the aluminum tubes used in construction of the former?

Problem was resolved by welding ¾x1½-in. bumper rods on bottom corners of the racks. These bumpers have netted us still another gain—sufficient clearance between racks to prevent hand injuries to personnel.—*Minos Asproyerakas, Vice President and Chief Engineer, National Baking Co., Chicago.*

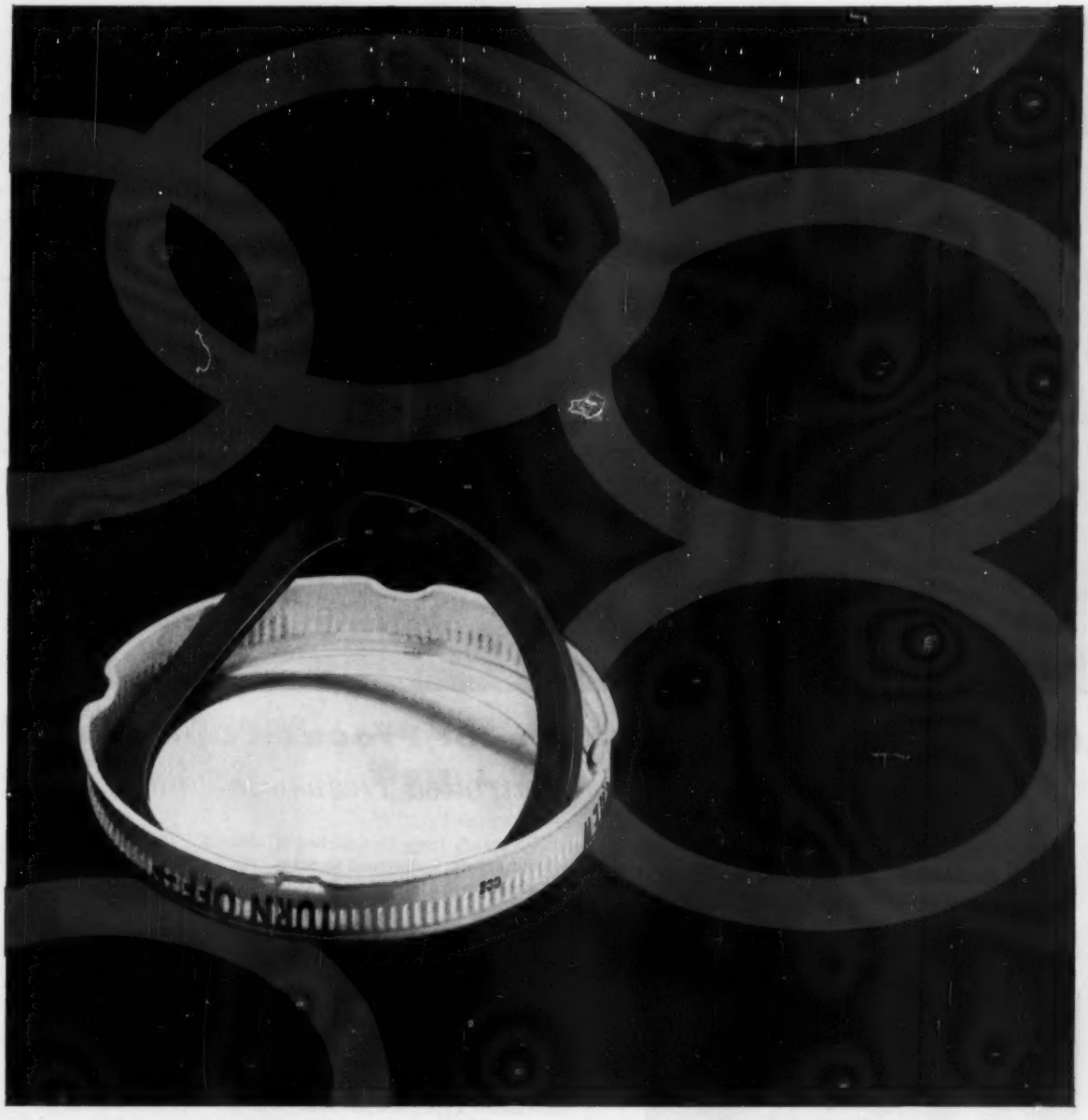
### Tank Conveyor Pays Off

Here's a labor saving device that more than paid for itself during the first year.

It's a chill tank conveyor system, perfected by our chief engineer, W. J. Camp and installed in our Canton, Ga. plant two years ago.

System comprises an oval-shaped


For more data, circle 293 on Reader Service Card



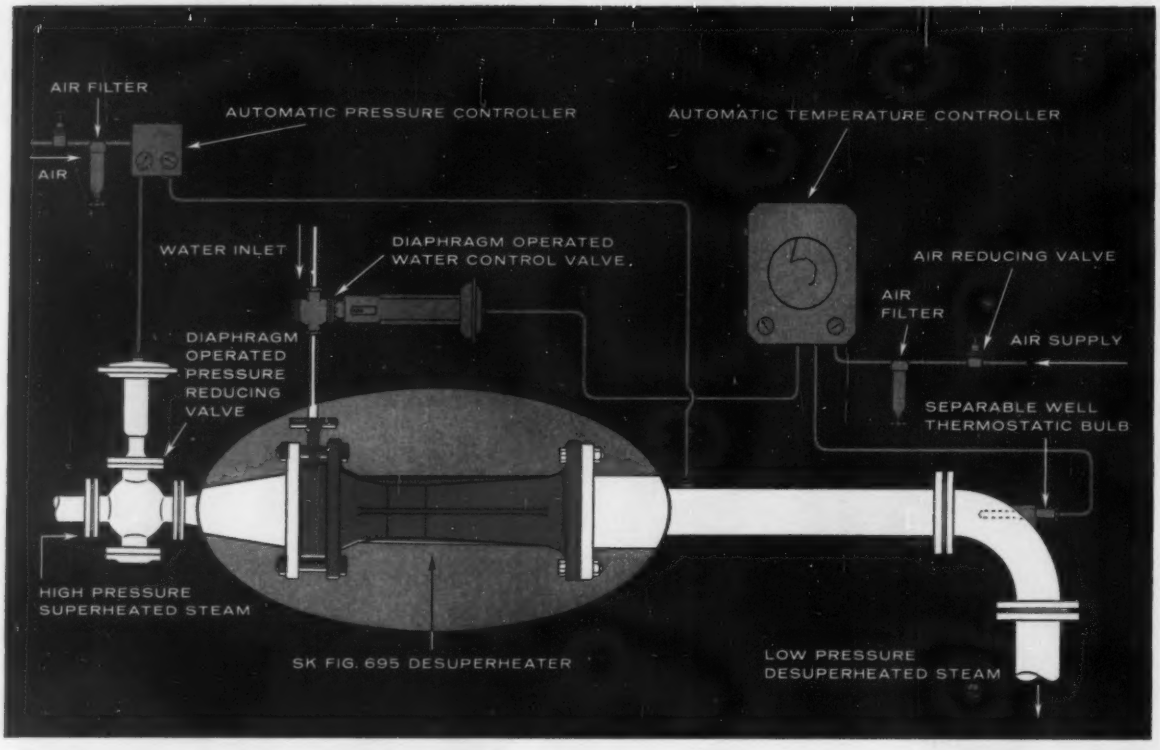
# CROWN...only source for lug caps with LIVE RUBBER RINGS

This exclusive Crown combination gives packers a closure that quickly, completely seals in product quality on the packing line and in homes of users. *Live rubber best withstands* live steam temperatures . . . *will reseal again and again* . . . and Crown live rubber liners *will not stick to glass.*

Crown developed a special glass finish that permits easy cap application and prevents any backing off of the cap as in some types of finishes. When the Crown lug is applied to this finish, you have a mechanical as well as a vacuum seal. Crown is ready to meet all your closure needs.

*for cans • closures • crowns • machinery* **CROWN**

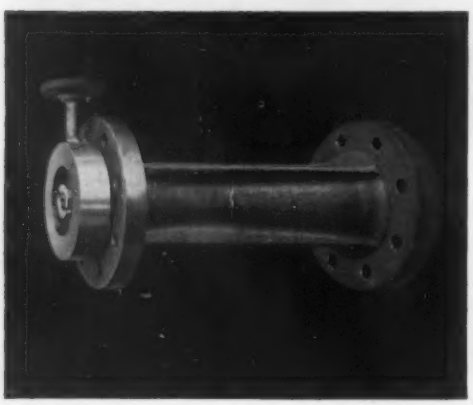
**CROWN CORK & SEAL COMPANY, INC., 9300 Ashton Road, Philadelphia 36, Pa.**




# Reduce Steam Temperature for Process Operations

## *with this light, easily-controlled Desuperheater*

SK Fig. 695 Venturi Type Desuperheater. An important feature of this desuperheater is the fact that the water need not be at higher pressure than the steam entering the desuperheater. As noted in description, right, water can enter the unit at inlet steam pressure.



The SK Venturi Type Desuperheater, shown in the illustrations above and at left, is designed to reduce the temperature of superheated steam to the lower temperatures required for use in process operations and for operating plant auxiliaries.

These Desuperheaters are light in weight and small in dimensions—are supported directly by the superheated steam line. In addition, they are simple in construction, provide straight-through flow with only a small pressure drop. Because these units are designed for application with automatic control, they are particularly well suited for process and petroleum plants where steam flow varies. They can, however, be used without controls where steam flow is steady. In such cases only a separator need be added.

The Venturi Type Desuperheater reduces steam temperature by bringing water into contact with the superheated steam. The water pressure is low since it need only equal the operating steam pressure. The water is preheated in the chamber around the water diffuser and issues, through many small jets, into the steam stream. Since the steam-water mixture is discharged through the desuperheater outlet in a fog-like condition, without contacting the sidewalls, maximum desuperheating effectiveness is obtained and minimum wear occurs in the discharge piping.

The particular desuperheater shown is one of four types made by SK for process plants. Complete details on all types are contained in Bulletin 6D. Write for a copy.

JET APPARATUS: Ask for Condensed Bulletin J-1.
ROTAMETERS & FLOW INDICATORS: Ask for Condensed Bulletin M-1.
VALVES: Ask for Condensed Bulletin V-1.
HEAT TRANSFER APPARATUS: Ask for Condensed Bulletin HT-1.
GEAR PUMPS: Ask for Bulletin 17-A.

**Schutte and Koerting**
COMPANY
MANUFACTURING ENGINEERS SINCE 1876
2223 State Road, Cornwells Heights, Bucks County, Pa.

track of roller-conveyors set in the floor between eviscerating and packing lines, and a dumping mechanism at the latter point. A "switch-yard" on one side of the track provides space where we can hold or store tanks.

Now, the tanks are moved from filling to dumping positions easily, and with less direct labor than formerly. An added benefit here is reduction in floor wear. They are no longer subjected to terrific punishment from wheeled tanks.

Cost of a system to handle 100 tanks was about $14,000 installed. Maintenance has been $400 for the two years of operation. We feel the system paid for itself in less than a year, and that it makes us more money for each dollar invested than any other piece of equipment in our plants.—*W. C. Pulliam, Jr., Gold Kist Poultry Growers, Canton, Ga. (From talk at Amer. Poultry Industries' Fact Finding Conference.)*

### Gravity Conveyor Rack Speeds Pallet Return

When Geo. A. Hormel & Co. modernized the materials handling setup at its Austin, Minn. packing plant, the company installed 10 miles of live conveyors, arranged in racks, for storage of over 700 varieties of packaged meats.

Each rack is comprised of steel uprights with cross members that support conveyors, set at a slight pitch so cased goods fed onto them move to the discharge end.

To permit stacking of cases in the racks, special plywood pallets are used. And in assembling orders for

**oust it with a Dow Corning SILICONE DEFOAMER!**

**When foam moves *in*, efficiency moves *out* . . . production goes down! Costs go up! If foam is hogging space in your plant, knock it down with Dow Corning SILICONE DEFOAMERS . . . most versatile and effective foam killers made!**

**1 oz kills foam in:**

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**20,833 lb** chewing gum base

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My foamer is
Oil system
Aqueous system
Other




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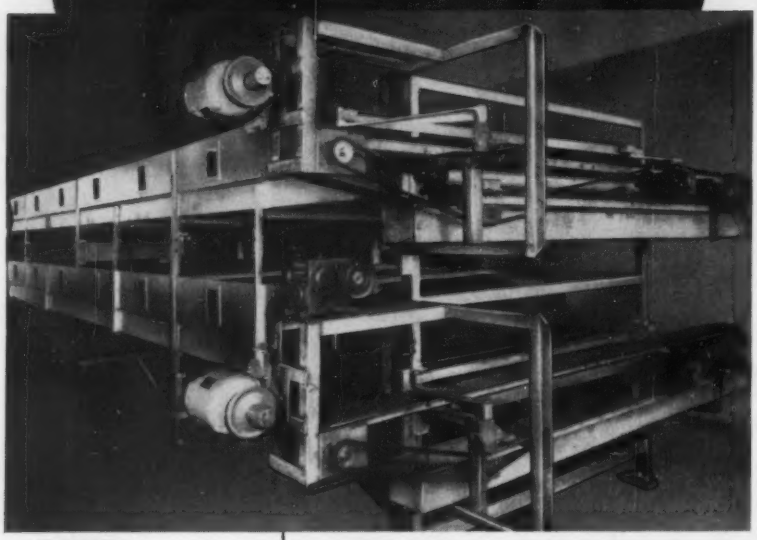
# CUSTOM BUILT
## Food Processing Equipment



Pictured above is an SMP double-deck pasteurizer-cooler designed and built for one of America's foremost food processors. This *custom-built* unit assures accurate, constant temperature control for perfect, uniform pasteurizing and/or cooling. Assures maximum production in limited floor space. Separate controls permit dual or single unit operation. Flexible heat control assures correct steam requirement for any container load from one to 500 units. Readily economically expandable in widths from 3' to 8' and in any length needed to meet production and processing requirements.

## Costs You No More to Buy

## Costs You Less to Operate

Every SMP pasteurizer, cooler, conveyor or related unit is designed and built to your particular need. In combination these machines form SMP food processing lines *custom-built* to your operation's specific requirements.

For more than 15 years, Standard Metals Products has proved by performance in the plants of America's foremost food processors that *custom-built* processing equipment can *cost no more to install . . . cost less to operate.*

All SMP asks—*without obligation whatever on your part*—is an opportunity to demonstrate what we can do for you.

**STANDARD METAL PRODUCTS**

**STANDARD METAL PRODUCTS CO., 123 N. RACINE AVENUE, CHICAGO 7, ILLINOIS**

GENTLEMEN: We are interested in your recommendations in regard to the food processing equipment checked, or described in letter attached:

☐ coolers ☐ exhausters ☐ pasteurizers ☐ accumulating tables
☐ can washers ☐ case-sealers. No obligation incurred.

Company_____

By_____ Title_____

Address_____

City_____ Zone_____ State_____


## *Practical Ideas*

shipping, cases are transferred from the pallets to gravity conveyors, (right in photo).

When planning the system it was realized that some method of returning the empty pallets to the loading end of the racks must be devised. This was accomplished by installing a smaller conveyor rack adjacent to the product handling ones.

Empty pallets are inverted and placed on the smaller track (arrow) which is pitched for their gravity return to the loading station. This requires very little space and practically no labor.—*FE Staff.*

### Electricity Everywhere

It is possible to plug into 110-v. electric power at any point on any wall of the plant test-kitchen at Comstock Foods, Inc., Red Creek, N. Y.

Along the face of each wall at convenient 40-in. height is a screwed-on plastic strip with built-in electrical conductors at top and bottom edges. These conductors are covered by curved-over lips along the edges of the strip so that no contact is made by anyone brushing against the strip. But lever-action plug-in units can be snapped into the strip anywhere to make contact with the conductors. Appliances cords then can be plugged into these units.

A ridge along the center of the plastic strip fits into a corresponding groove in each plug-in unit, to center the latter.

Called Electrostrip, the handy power source connects to a wall outlet box at one end. It is made by Bulldog Electric Products Corp.

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Just send us the facts about your idea and its application. And include a free-hand sketch or snapshot to show how it works.

We'll do the finished writing and drawing for you.

Send your idea today, before your forget. Address it to Practical Ideas Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.—The Editors.

# WHAT IS PRO-80?

## Economical Source of Concentrated Protein— with many processing bonuses

More and more food processors recognize the fact that "Protein Enriched" on their food label means greater sales volume. General Mills Pro-80 Vital Gluten is 80% wheat protein (m.f.b.). It adds sales stimulus to existing foods, helps create protein-rich premium-priced products.

Pro-80 can assist in processing of food products in many ways. For example:

**Pro-80 serves as a binder in cereals and meat products.**

**Adds "bite" to macaroni and spaghetti.**

**A meat substitute in vegetarian products.**

**Strengthening agent in pretzels.**

**Increases absorption in yeast raised baked foods.**

**Liquid Absorber in gravies and meat pies.**

Perhaps you can use Pro-80 Vital Gluten to good advantage in your products. You'd do well to have your product development people look into it. To get the facts on how Pro-80 can help you, send the coupon below.

**SPECIAL COMMODITIES DIVISION**

*Minneapolis 26, Minnesota*

General Mills

**Get more facts *fast***
***SEND COUPON TODAY***

*Special Commodities Division*
*General Mills*
*Minneapolis 26, Minnesota*

Yes, I'm interested in opportunities with Pro-80 in the following fields:_____

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Firm_____

Address_____

City_____ Zone____

State_____



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# YOU CAN SHIP LIQUID FOODS

## They ship safer—keep foods fresher,

LIQUIPAK, THE NEWEST THING IN FIBRE DRUMS, SHIPS PICKLES, OLIVES, SHORTENING, CHERRIES!
OR ANYTHING PACKED IN BRINE OR SYRUP.
LIQUIPAK'S PURE POLY LINER GIVES SANITARY PROTECTION, RETAINS FLAVOR, AND KEEPS OUT IMPURITIES!
LIQUIPAKS ARE 30 LBS. LIGHTER THAN ORDINARY DRUMS, YET STRONG!
AND FOR EASY DISPENSING, THEY HAVE A REMOVABLE HEAD!
AND THE BUNGS HANDLE ANY STANDARD FITTINGS. YOU CAN PUMP, DIP, OR POUR!

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## longer! And they're lighter, stronger!

THEY COST LESS, AND HAVE LOWER TARE WEIGHT, TOO!
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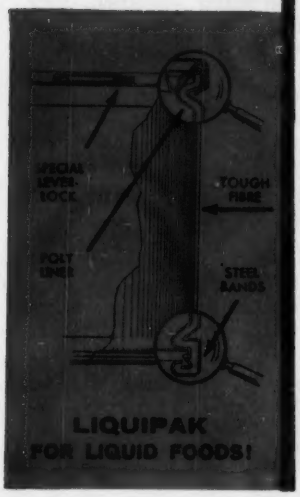


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**COMPREHENSIVE pilot plant abounds with specialized process equipment (listed at right). Units can be combined in widely diverse arrangements for new-product development.**

# How Top-Rung Pilot Plant

**Corn Product's facility translates laboratory concepts into full-scale processes, also provides enough of new item (such as instant starch) for vital market testing**

TODAY'S 'PILOTING' of new food items dramatically emphasizes the critical interdependence of research, production, and marketing forces.

Take, for example, our versatile Argo, Ill., installation, which has given our pilot operations striking new scope and direction. Here, we have an array of carefully selected facilities that (1) provides manufacturing data, (2) produces enough of a new product for field testing and promotion, (3) progressively builds demand that can serve as starting volume for the main facility, and (4) enables accurate cost estimates.

Significantly, a completely integrated pilot plant is not always required, particularly when a new-product idea is examined on the basis of existing conditions.

In some instances, pilot equipment is already available due to prior development of a similar product. In other cases, only one or more new process steps may require pilot treatment. Of course, where basic measurements and control procedures are involved, available information may permit accurate prediction of results—thus eliminating the need for pilot-plant confirmation.

Ideas for new products spring from many sources. Some 20 well-known consumer products, and more than 450 diverse items now used industrially, have resulted from Corn Products research and development.

From our laboratories and experimental kitchens come a never-ending stream of ideas for new products. But under exacting tests, only a small percentage of them reach the point where they actually go into production. In fact, score or more may go through initial research and testing stages for every one that finally qualifies for the company's line.

Anticipating the diversity of such products, we set up extensive facilities in a large building specifically designed for pilot-plant equipment covering virtually all major unit operations. For processes in our "bread and butter" operations, such as drying, engineers have 10 to 15 types of machines to choose from.

All equipment closely simulates commercial units so that scale-up of pilot-plant studies and recommendations for commercial operations can be made quickly and accurately. Machinery can be moved and arranged into limitless combinations as desired. To facilitate this, a 40-ft. traveling crane (5-ton capacity) extends the length of the building.

We save considerable time, money, and effort by not having to buy or build a separate unit for every new project. This also speeds progress on many developments and, correspondingly, advances start-up of production units without sacrificing

**R. M. OLSEN**

Project Leader, Corn Products Co., New York City

## Major Equipment Used in CP's Pilot Operations

**Drying**

4 Tray dryers
3 Rotary dryers
1 Flash dryer
2 Spray dryers
1 Tunnel dryer
1 Rotary vacuum dryer
1 Vacuum tray dryer
1 Radiant-heat dryer
3 Double-drum roll dryers

**Evaporation, Distillation**

1 Distillation column, 50 ft. high
1 Forced-circulation evaporator
1 Falling-film evaporator

**Blending**

4 Ribbon blenders, 10-500 lb. capacity
1 Double-cone blender, 2,000 lb. capacity

**Grinding, Screening**

7 Hammer and impact mills
2 Wet screens
3 Dry screens
2 Air classifiers

**Separating, Dewatering**

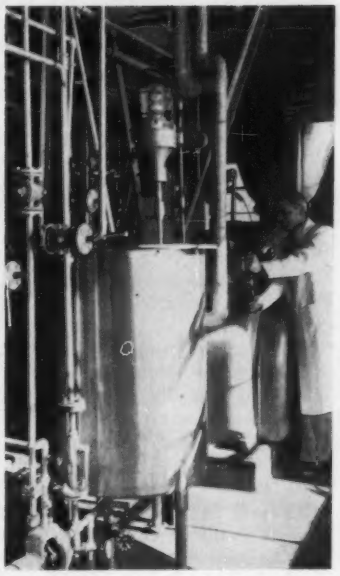
6 Plate-and-frame filters
2 Pressure leaf filters
3 Rotary vacuum filters
1 Thickening press
2 Suspended basket centrifuges
1 Horizontal-bowl continuous centrifuge
1 Super centrifuge
1 Disk-stack centrifuge

**Heat Processing**

50 Closed reaction vessels and autoclaves, ranging 10-2000 gal. and up to 150 psi.

**Miscellaneous**

Ion-exchange columns
Char-adsorption columns
Closed-loop piping for acid and alkali
Heat exchanger provided with refrigerant and high-temperature heat-transfer agents



CLOSEUP: Precooked starch in agitator tank is pumped to spray dryer.

# Bridges Gap to New Products

the quality of the pilot-plant work.

Facilities at Argo include a special "food projects pilot plant"—an area where an extremely high degree of sanitation is maintained.

Yet, such facilities occasionally prove inadequate for pilot production of a specific item. In that event we build a special working unit.

### 3-Phase Attack

Using instant spray-dried starch as a typical example, here is the development sequence that bridges the gap between laboratory and full-scale manufacture. There are three distinct phases:

1. Determining need for the product by kitchen and field testing.

2. Planning and designing the pilot plant, and setting up and operating equipment to produce the laboratory product.

3. Analyzing the economics, engineering the full-scale plant, and setting up operation and control data.

Phase 1 actually began when, some years ago, the advent of instant-pudding mixes pointed up the need for a greatly improved starch-thickening agent. The original idea fo a dry mix that required no cooking aroused intense enthusiasm, but early mixes failed to meet expectations because of poor gel characteristics, unstable quality, and inferior flavor.

The concept, however, held such potential that its pioneers persisted in attempts to improve the product.

Study revealed the need for a compatible, all-white, pre-cooked starch. Further, it had to be powdered finely enough for fast dispersion in liquids and solutions. Also essential were low moisture content for improved stability, and stabilized viscosity for easy reconstitution of mixes.

Aiming for these carefully defined goals, we initiated development of a starch that would have utmost clarity in paste form, minimum set-back, long shelf-life, and minimum flavor. Applications envisioned for such a product included instant puddings, pie fillings, salad dressings, confectionery products, bakery toppings, soup and gravy powders, and various sauce bases, frozen and dry.

Research lasted four years, during which the company tested starches from several grain crops before selecting milo, closely related to regular corn, but previously unavailable in commercial quantities.

In a searching examination of all factors, it found that spray drying yielded especially desirable properties that are unobtainable by either roll drying or flash drying. Favorable characteristics of spray-dried starches were readily apparent even after months of storage to which all trial formulations were subjected for shelf-life information.

After the Research Group determined optimum formulations from performance in the company's kitchens, small samples were distributed to customers for testing in their own experimental kitchens.

Users reported conspicuous advantages for the newly developed spray-dried milo starch.

### Gaging the Variables

Highly satisfactory product performance at this point justified a preliminary analysis of factors that determine cost and price. Questions arising involved cost of raw material, dependability of its source, competitive situation, sales potential



*For free reprint of this article, write E-3 on Reader Service Card, back of issue*

of the new product, investment in production equipment, and its operating cost. All these questions could be reduced to two:

**Can the product be produced at reasonable cost?**

**Will consumers buy at the estimated price?**

Many development projects end at this stage.

However, our analysis indicated the desirability of increasing production to permit extended field testing. But with no precedent for large-scale production of this completely new food ingredient, preparing sufficient amounts for widespread test posed a formidable problem. Food technologists generally concede the difficulty of obtaining the same type of mixing in a 1,000-gal. tank as in a glass bowl.

Phase 2 began with an examination of available equipment to devise the most economical production method. This phase required ample output of the new product for field testing and for obtaining detailed manufacturing data and cost estimates.

As mentioned, the optimum formulation prepared was a spray-dried product. Previously, fine starches were drum-dried, then milled to a powder. The preferred process, however, explicitly required that starch be atomized to preserve whiteness, reduce moisture content, and insure extremely fine and uniform particle size.

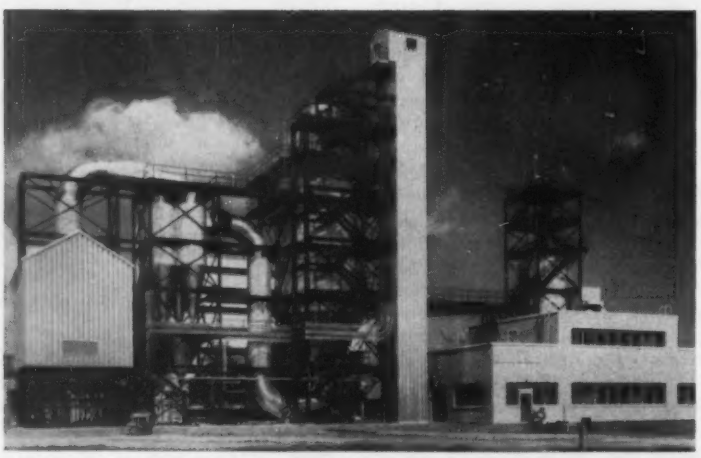
After careful examination of process requirements, it was determined that a 10-ft.-dia. experimental spray dryer, available from our general pilot-plant equipment, was suitable.

Initial operation brought a number of minor troubles and their solutions, along with interesting allied disclosures: Inlet and outlet temperatures, of course, greatly affect drying conditions, hence definitely influence the type of end product. Overdrying makes a starch too thin. Thin starch fails to give puddings the desired firmness.

Atomization pressure also affects product quality. If too low, faulty drying results. If too high, particle size goes astray. Pregelatinizing the starch brought other problems. Variations in processing time and temperature alter performance. It was found that starch must be cooked at a specific temperature and for exactly that correct period to attain proper viscosity.

Field reports on any sort of pilot-plant food product invariably show, in early periods, need for additional laboratory work to improve the formulation. Operation at Argo was temporarily interrupted several times to make product and process refinements. Data accumulated by the Technical Service Department played a major role in giving direction to modifications and in estimating sales potential.

Phase 3 started when reports from Technical Service confirmed that customers found the market acceptance of their products impressively enhanced by use of the new starch. During this final phase, pilot-plant operation continued to supply instant spray-dried starch while our company planned and completed a full-scale unit.



**IN FULL-SCALE FACILITY,** designed from pilot-plant data, starch paste is atomized at 6,500 psi. and dried to uniform fine particles.

This project took shape from a comprehensive *Recommendation Report* prepared by the Development Department for the company's Central Engineering Department. It was based on a detailed economic analysis and study covering all facets of producing the new starch in volume, and it incorporated stipulations on market price and plant output.

Growth predicted for use of mixes containing pre-gelatinized starch gave impetus to recommendations for a giant manufacturing unit, chiefly of open-air construction in a suitable climate. Selected was a site at Corpus Christi, Tex. After scrutinizing plans, specifications, and cost estimates, our company budgeted more than $1 million for construction of the new facility (described FE July '57, p. 62).

Its layout comprised four main elements, each with a different function: To dilute, form paste, cook, and spray-dry the starch.

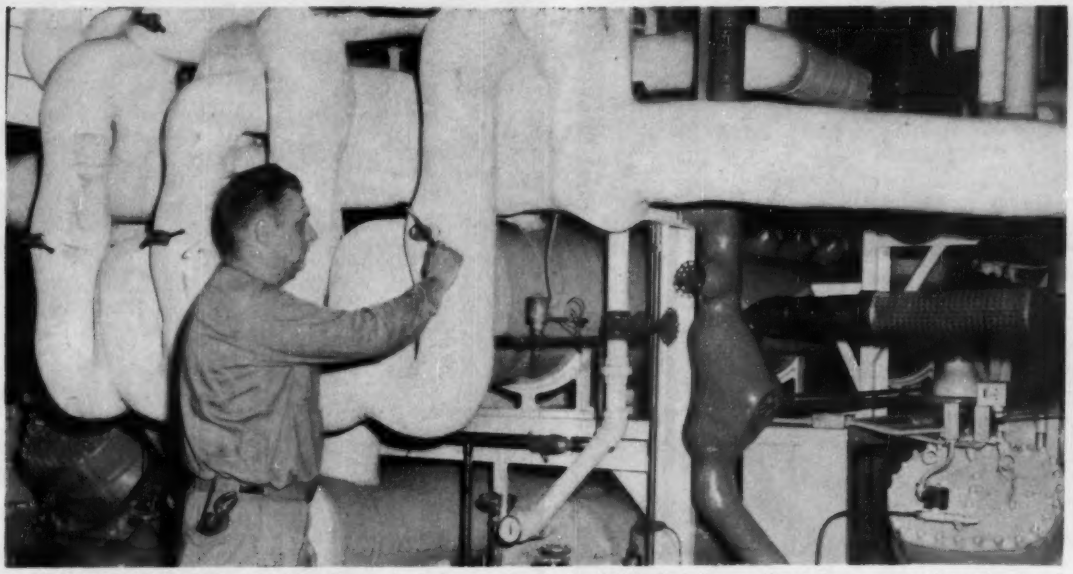
Despite the widely diverse purpose of each element, designers scaled these major components with individual capacities balanced for highest operating efficiency. Instrumentation to monitor all operations was centered in a master panel, permitting one man to automatically control process variables and product quality.

Experience gained in pilot-plant operation resulted in special safeguards to prevent development of odor, off-color, or flavor in the finished starch.

To illustrate: Air supplied at 60,000-70,000 cfm. for spray-drying is first purified by passage through an oil bath and 10-ply dry filter paper. It is heated to the 350-450F. range by burning deodorized natural gas in the air stream. Prior to use, this gas is specially refined by passing through an iron-oxide column and through two columns of activated carbon for removal of mercaptans or other deleterious compounds.

Utmost thoroughness in filtering and purifying process water is also required, because of extreme purity required in the instant spray-dried product. Passing the water through a charcoal absorber removes all flavors and odors, and filter-polishing prevents carryover of carbon particles.

From this water, steam for pasting the starch slurry is generated in a special stainless-steel steam-heated reboiler. Type 316 stainless steel is used for all equipment contacting the starch.



**100-TON COMPRESSOR** (right) handles entire bakery-cooling load, which otherwise would require seven smaller units at various locations. Second compressor (left) serves as standby should first machine fail or additional capacity be needed. Insulated piping is covered with canvas specially shrunk-fit to line.

# Central Refrigeration Cuts Costs

**Ingenious setup eliminates scattering of compressors, yet enables efficient multi-zone cooling. Moreover, it eases maintenance and provides for future requirements.**

LIKE MANY FOOD FIRMS designing new plants, National Baking Co. had a refrigeration problem.

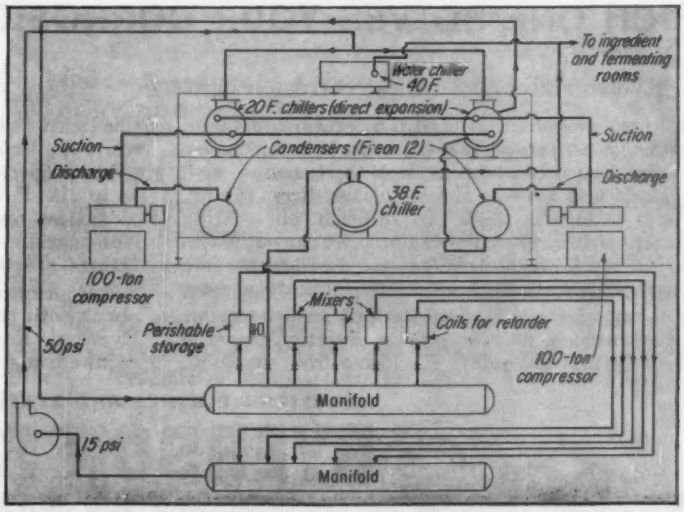
Calculations called for seven compressors with total capacity of 85 tons. Installing these units, along with accessory chillers, piping, and wiring, would be complicated and expensive.

Specifically, we needed:

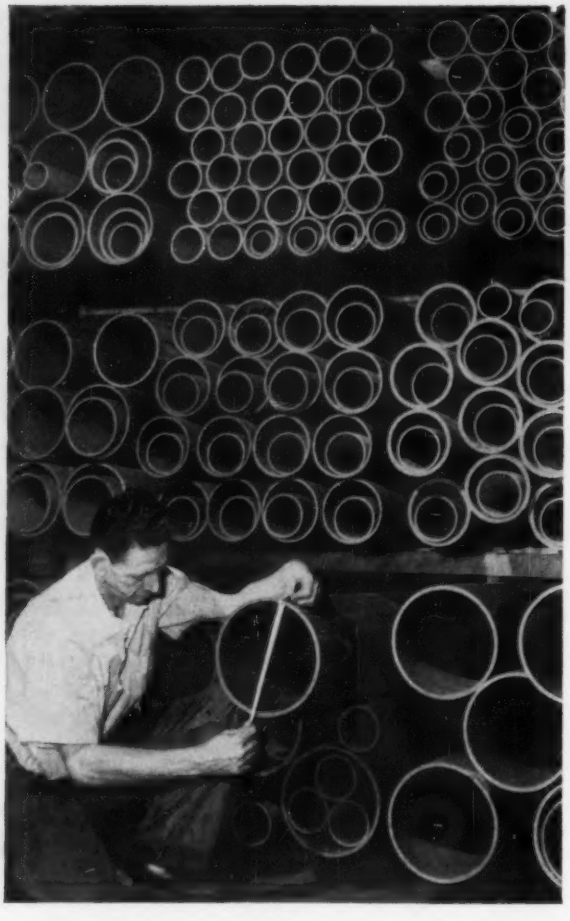
1. 30 tons of refrigeration to maintain sponges and doughs in mixers at 78F.
2. 10 tons (in warm months) for 74F. ingredient-holding and 80F. fermenting rooms.
3. 35 tons (separate low-temperature system) for 33F. retarder and 33F. perishable-storage rooms.
4. 10 tons (still another system) for chilling makeup water going into dough mixers. (Turn page)

**M. ASPROYERAKAS**

Vice-President & Chief Engineer, National Baking Co., Chicago




**TRIPLE-DUTY** layout. System (1) supplies 20F. glycol to dough mixers, retarder, and perishable-storage rooms; (2) provides 38F. glycol for cooling ingredient and fermenting rooms; and (3) furnishes dough mixers with 40F. makeup water. In all, four chillers are used.



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And there was a further problem—adequate standby facilities—which are vital for dough mixing, as well as in fermenting and other cooling areas. Too, additional refrigeration capacity had to be on hand for near-future needs, such as proposed cooling tunnel for cake icing and air conditioning for entire makeup area and sweet-goods department.

All this added up to the need for a new approach to engineering a refrigeration system. Called for was—

**. . . Simple, low-cost installation.**
**. . . Foolproof facilities.**
**. . . Ample load capacity.**
**. . . Adequate standby equipment.**
**. . . Flexibility for distributing refrigeration anywhere in bakery.**
**. . . Expansion of facilities to various areas calling for additional cooling.**
**. . . Reduction in amount of accessories that would otherwise be needed for seven compressors (water and expansion valves, high- and low-pressure controllers, oil protectors and starters, motors, belting, wiring, and piping).**

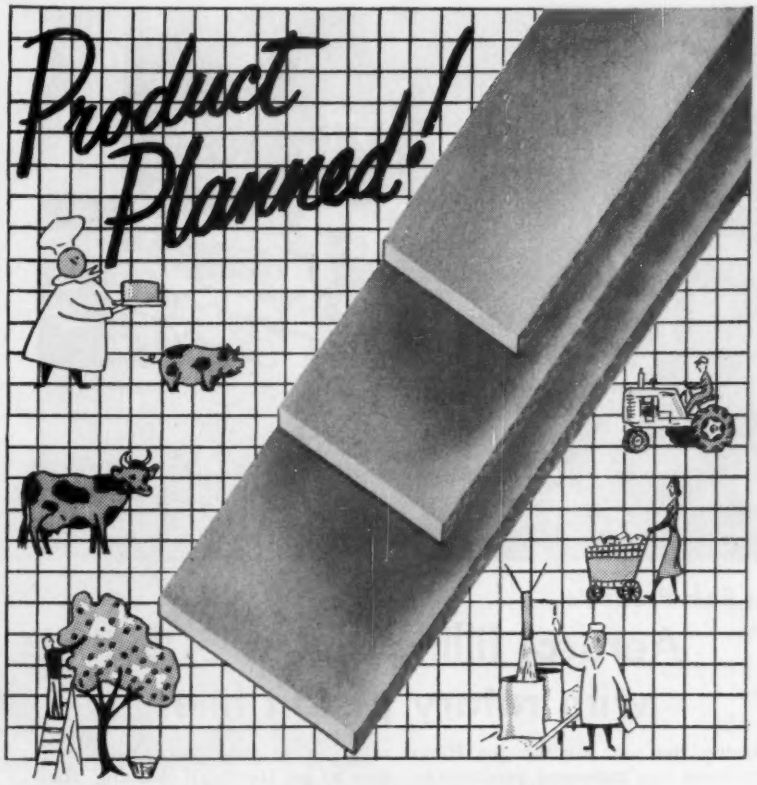
Our thinking was simply this: "Why not take a cue from the method of distributing hot water from a central location (surge tank) or source nearest the greatest demand? Here, water is simply raised to a pre-determined temperature by a heat-exchanger and carried through galvanized piping to various points of use. So why not distribute chilled water in a similar way?"

But we ran smack into knotty problems—cooling-water temperature is limited to about 35F. to avoid freezing and, when considering refrigeration losses while distributing it, we knew we'd be faced with inadequate cooling capacity. Logical solution was to use a non-toxic, antifreeze refrigerant, as propylene glycol, rather than water, which would permit lower cooling temperatures.

Again we were forced to make another decision, that of selecting mixers designed for either direct-expansion or liquid-circulation.

We chose the liquid system to avoid cold spots and mixer-jacket frosting, typical in direct-expansion setups, and to take advantage of superior heat-transfer properties of 20F. glycol. Furthermore, use of modulating valves would facilitate accurate, automatic control of dough temperature.

Next, we installed two 4-cylinder reciprocating-type compressor units (Worthington), with one as a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at Rich Products

## Aerosol filling spurts 50% with rotary piston filler

During the past six months Rich Products has increased production output for aerosol packed whipped dessert topping by a full 50%. At the same time line personnel was cut by one-half.

A major reason for this increase was Rich's switch to a Pfaudler rotary piston filler.

**Fast fill without spill**—Rich fills from 20,000 to 40,000 seven- and twelve-ounce cans in an 8 hr. day. In spite of this speed and in spite of the small can openings, Rich holds accuracy to one or two grams on both sizes.

**Easy sanitation**—There's no place for a food product to get trapped on a Pfaudler filler. Cleaning is so simple, Rich accomplishes it with one man in just one-half hour. He removes only two parts at each station to get thorough cleaning. Rich reports that the bacteria count on toppings is ZERO.

**Easy maintenance, too**—Rich has had absolutely no maintenance other than routine cleaning and lubrication. Not one minute of production time has been lost to breakdown or parts replacement.

**Just right for heavy products in aerosol**—Pfaudler fillers are particularly well suited to heavy foods like Rich's topping and also to such products as tooth paste and shaving creams.

**Send for bulletin**—For details on the six-station filler Rich Products uses as well as larger Pfaudler Fillers, write for Bulletin No. 911.

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standby unit. Each is rated at 100 tons, employs Freon 12, and can handle more than present load requirements. Note that we are using only two compressors instead of seven.

Moreover, these large units are intentionally operated at relatively slow speeds by use of 60-hp. motors and five belts instead of seven. As a result:

1. Compressors run closer to load demand and avoid short cycling.
2. Service life is increased.
3. Full-load capacity is available, when needed.

True, we have paid for refrigeration capacity not presently required. But, it will be much simpler and less costly in the long run to change motors and add drive belts, when extra refrigeration is needed, than to install new compressors.

To insure that both compressors get about equal wear, one operates for a week, then goes on standby. However, it is ready for service whenever a single unit cannot meet an increased load demand.

In selecting chillers, we also provided for standby capacity. The direct-expansion liquid chillers (Acme) were installed for cooling glycol to 20F. Since this liquid can be chilled to −20F., we have ample refrigeration for future requirements.

In event one compressor breaks down, the other takes over and simultaneously cools both chillers. And should one chiller fail, either compressor will operate the other. These switchcovers are accomplished by adjusting compressors' pressure-control valves.

A third chiller, using the 20F. glycol as refrigerant, cools another glycol stream to 38F. for use in ingredient and fermenting rooms. In turn, this 38F. glycol is used to cool dough-mixer makeup water to 40F. in a fourth chiller (Hudson Bay). Air-operated thermostats (Johnson) modulate 3-way valves to maintain 20F. and 38F. glycols within 2F.

Provisions have also been made for refrigerating future installations by installing additional valves on glycol manifolds.

Piping is insulated with Foamglas (Pittsburgh Corning), 2 in. on 38F. glycol lines, and 4 in. on those carrying 20F. glycol. Pipes are also covered with a special canvas. It is double-coated with lagging adhesive (Arabol) which, when dried, shrink-fits canvas to line. Finally, color-coding makes all piping easily distinguishable. —*End*

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SOUP BASE SEASONINGS
PHOSPHATES
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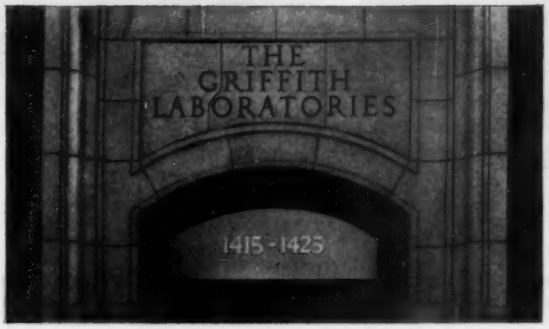


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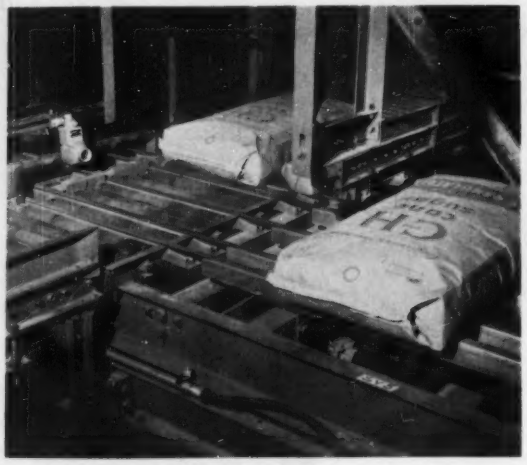
**PUSHBUTTON BAG SORTING:** Up to 12 types of packaged goods go to prescribed palletizer-accumulator lines as operator identifies item, feeds data to 'memory' panel (left).



**AT TRANSFER POINTS,** five V-belts (actuated by photoelectric relays) lift packages from main conveyor and deposit them on accumulator lines.

# Electronic 'Brains' Mastermind

**Economy, speed, and safety are features of automatic package-**

AS NEVER BEFORE, cost-conscious managements are replacing obsolete handling methods with advanced systems.

Outstanding in this modernization is the $1.6 million continuous-flow installation just completed at California & Hawaiian Sugar Refining Corp., Crockett, Calif. Here, inherently high handling costs are magnified by a huge plant area and tremendous production. Every 24 hr., 120,000 units of packaged goods go to a warehouse over 1,000 ft. away. Annually, this entails moving more than 600,000 tons of sugar in cases, bales, and bags.

Handling this complex of package sizes safely and rapidly called for considerable special equipment, which was designed and built in cooperation with Lamson Corp., Syracuse, N. Y. and General Electric Co., Bloomington, Ill. Among these units are automatic bag-sorting facilities employing modern static controls, and eight oversize palletizers to accommodate 60x44-in. pallets and loads ranging to 4,500 lb. Over 7,000 ft. of conveyors was installed to feed the palletizers.

**D. C. GUTLEBEN**

Mechanical Engineer, California & Hawaiian Sugar Refining Corp., Crockett, Calif.

## Machines vs. Muscles

In view of C&H's production, its former handling by fork truck, conveyor, and manual palletization was costly and cumbersome. Moreover, there was appreciable damage to packaged goods.

In addition to obvious handling economies, new system provides these three significant advantages:

**1. Mechanical palletizing gives better-balanced loads which, in turn, permits improved pallet stacking, more efficient use of storage space, and greater safety in warehousing operations.**

**2. Package damage, and subsequent re-handling costs, have been cut sharply.**

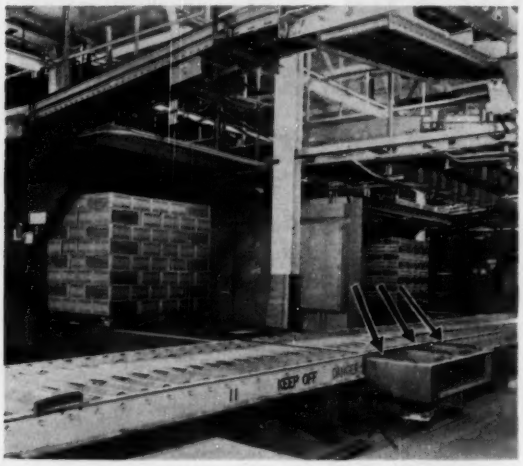
**3. Continuous product flow has greatly simplified production scheduling.**

On the debit side, more skilled mechanical and electrical maintenance is required. Even so, eliminating hazardous and arduous manual tasks has paid off handsomely in better employee relations. Workers are developing higher skills and are now engaged in more pleasant work.

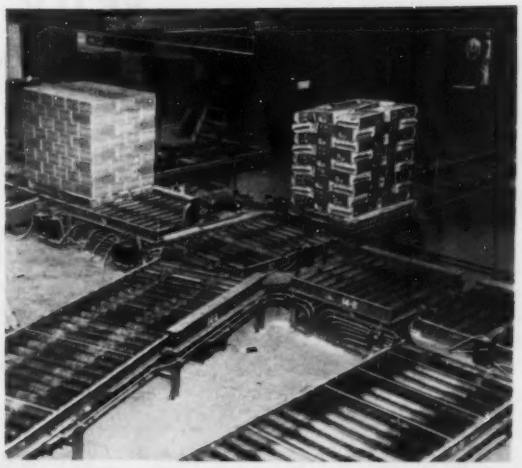
In addition to cased goods and sugar in paper bales, system handles three different items packed in 25-lb. bags, two in 50-lb. bags, and as many as twelve in 100-lb. bags. Any ten types of bagged goods can be moved simultaneously over ten accumulating lines that feed three palletizers. Four lines come directly from production, while the other six are routed through the bag-sorting station. Sorting is necessary because of the distance between packaging areas and warehouse, which precludes separate conveyors for each item.

With former manual palletizing, men were stationed along two long belts to remove the various bags and pile them onto pallets, one or more men handling each item. Now, in contrast, as many as six different products are delivered on one belt to the sorting station at up to 30 per min. The sorting is at the apex of an inclined belt some 40 ft. above the warehouse floor.

There were several reasons for selecting static controls for this highly repetitive sorting. In contrast to conventional controls employing mechanical relays, they have no exposed contact surfaces, hence cannot accumulate sugar dust. In addition, their reliability minimizes mainte-



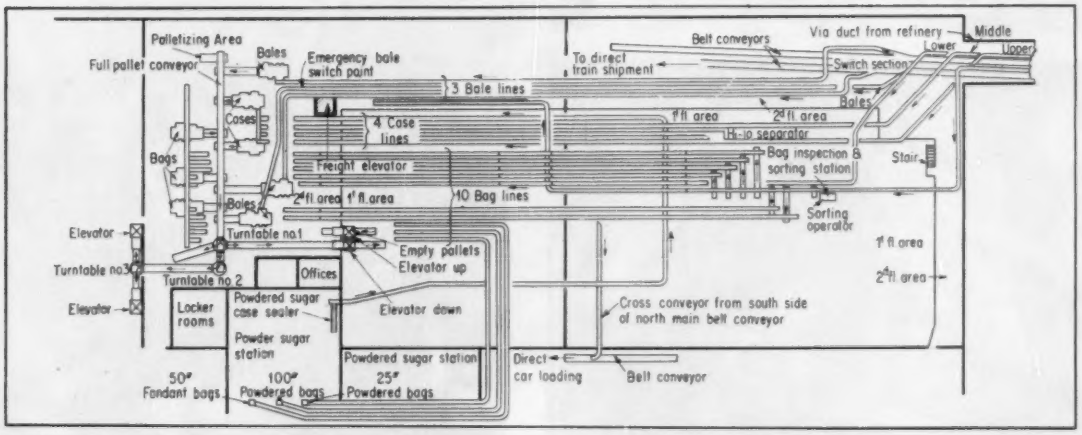
**LOADED PALLETS** from eight palletizers move onto this common take-away conveyor. Drag chains (arrows) are raised and lowered by limit-switch actions.



**TURNTABLES** speed palletized loads to storage areas or shipping docks. They may be operated either by photo-electric relays or sorting-station memory circuits.

# Multi-Item Package Flow

**sorting and palletizing system that handles 120,000 units a day**




**CONTINUOUS-FLOW** installation moves 120,000 units of packaged goods over 1,000 ft. every 24 hr.

nance and lost time, and installation and element replacement are simple. With mechanical relays certain control features would have been difficult and costly to obtain.

In sorting, 50- and 100-lb. bags spaced about 40 in. apart pass before an operator at a console. He observes the product as it passes and has about 2½ sec. to press one of six buttons. This directs a bag to a particular accumulator line designated to receive that item, or to reject it for subsequent hand palletizing if desired.

Package-routing information is compiled by memory circuits in the static-control panel and is relayed along the main conveyor as a bag passes photoelectric beams at various transfer points. By the time a bag reaches the specified transfer point, its routing has already been established. To effect transfer, a photoelectric relay energizes a solenoid valve that operates a pneumatic cylinder. Latter raises the transfer-conveyor frame, which has five continuously running V-belts normally positioned between rolls of main trunk conveyor.

Belts contact bottom of bag and rapidly move it (at right angles to trunk line) into position over its accumulator line. Next, bag contacts a relay beam that energizes a



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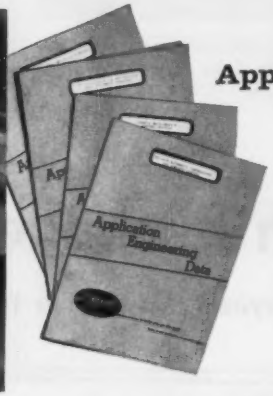


**Application Engineering** — Before any application of a Foxboro Instrument or System is recommended, it has been exhaustively group-studied by Foxboro Engineers with specialized knowledge of specific industry requirements and characteristics of the process involved. Resulting Application Engineering Data is available on request.

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solenoid valve and cylinder to lower the belts between live rolls of accumulator conveyor.

### Flexibility Featured

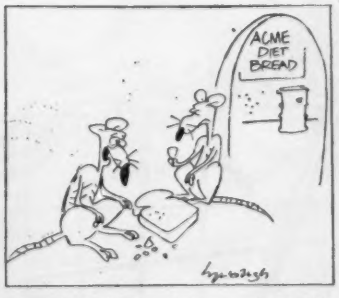
Each accumulator line is about 300 ft. long. All ten can feed one palletizer, or various combinations may be diverted to any machine by the flexible conveyor system. When a pallet load has accumulated on any line, last bag triggers a limit switch that signals the palletizer to receive the lot. It automatically sets up to receive this item and starts the accumulator line.

At each palletizer, there is a selector switch that can be set to send palletized loads to any of four destinations. Control system 'remembers' the routing established for each load from any palletizer.

As loaded pallets are discharged, they move (on chain rollers) into positions along a main live-roll conveyor. When latter is clear, each section of chain conveyor rises and positions its load above main conveyor. When load is properly oriented, bottom board of pallet contacts a limit switch to lower the chain section between live rolls of main conveyor. Loaded pallets are thus transferred to main conveyor.

Enroute to their destinations, they traverse three turntables whose operations are controlled either by photoelectric relay beams or limit switches. Latter operate through the selector-switch memory system. Loaded pallets can be discharged on the second floor, or sent to any of three elevators for discharge on first floor. Here, they are fork-trucked to storage or shipping areas.

Elevator operation is controlled by the pallet-contacting limit switches, which energize electrical circuits. There is also an elevator that automatically delivers stacks of empty pallets to second floor. —*End*




**"I can't understand it . . . I eat like a horse."**

# New Light on Beer Flavor

**Here are ASBC-meeting reports on its micro-constituents—**

**Tannins in Beer.** Malt contains about 0.1% tannins and hops 5-6%, but about ⅓ of that in wort and beer (latter contains about 170 ppm.) comes from malt. Dryness of beer is credited to tannin, with increments of 25 ppm. detectable by taste.—*Owades, Rubin, and Brenner, Schwarz Laboratories, Inc.*

**Sources of Diacetyl.** Diacetyl should be present in beer at low levels (0.2 ppm. or less) to avoid "buttery" flavors, usually considered undesirable. This flavor is due to lactobacilli of both rod and coccal types. Well dispersed yeast tends to remove it, or prevent its formation. —*Burger, Glenister and Lautenbach, J. E. Siebel Son's Co.*

**Flavor and Stability.** Compounds containing sulfhydryl (-SH) groups can affect both flavor (volatile mercaptan types) and colloidal stability of beer. Determination of -SH is made by amperametric titration with silver nitrate. Sulfhydryl content increases during fermentation and decreases during bottle storage. Exposure to light, however, may increase -SH groups with production of the unpleasant "light-struck", "skunky" flavor.—*Brenner, Schapiro, and Owades, Schwarz Laboratories.*

**Gas Chromatography** may be employed to isolate esters and higher alcohols in beer, using glycerin as absorption medium. Average commercial beer contains 21.4 ppm. ethyl acetate, 2.6 ppm. amylacetate, 19.5 ppm. active amyl alcohol, 57.7 ppm. iso-amyl alcohol.—*Vander Kloot and Tenney, Wahl-Heinus Institute, V. Bavisotto, Paul-Lewis Labs.*

**Analyzing gases** in beer for oxygen and nitrogen by gas chromatography shows that the uptake of molecular oxygen is not appreciably affected by presence of glucose oxidase, ascorbic acid, or iso-ascorbates. Their stabilizing powers therefore cannot be attributed to removal of molecular oxygen.—*Bethune and Rigby, Research Div., Canadian Breweries Ltd.*

**Volatile Reducing Substances** in fermenter gases are determined by passing a measured amount of $CO_2$ through absorbers containing standardized acidified $K_2Cr_2O_7$ solution, then back titrating with thiosulfate.

Average demand of fermenter $CO_2$ for $O_2$ was 5.22 mg./liter of gas. This was reduced to 0.63 mg. by washing, to 0.28 mg. by liquefaction, and to 0.22 mg. by carbon purification.—*Zilliotto, Turczany, and Bockelmann. F. & M. Schaefer Brewing Co.*

**Foam Adhesion to Glass** when evaluated by a reflectance method showed that this desirable property is chiefly due to the alpha-acid fraction of hops. Unhopped beer does not have this property, nor do other hop fractions, tannins, lupulone or hard resins impart it.—*Holmstrom, Pollock, Ulbricht, and McLary, Anheuser-Busch, Inc.*

**Pressure in Canned Beer** which was undisturbed was 47-58 psi. at 140-170F., compared to 82-95 in agitated cans. During pasteurization, pressure is 10-24 psi. less than equilibrium pressure obtained by agitation. — *Maliszewski, Strodtz and Warden, Continental Can Co.*

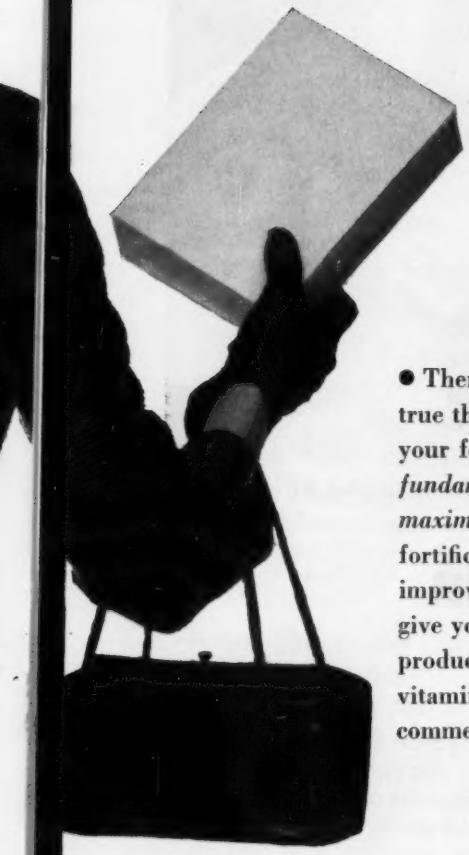
**Improving Stability.** Polyvinylpyrollidone (PVP Type K-90, mol. wt. 500,000-750,000) added to the kettle at rate of 3-4 lb./100 bbl. just before end of boiling, precipitated tannins, improved hop utilization, and did not affect foam. When added in large amounts (200 ppm.), it stabilized beer but did not precipitate tannin. Authors also reported on silica gel chromatography of beer for selective removal of protein fractions. A red dye which absorbed low molecular wt. fractions preferentially was used to determine amounts of protein fraction on this column.—*McFarlane and Grant, Canadian Breweries, Ltd.*

# *Question . . .*

**Three of the many groups of foods and beverages that are increasing sales with Pfizer vitamin fortification and enrichment:**

- A health plus on the label of carbonated beverages says "Vitamin C Fortified" and means sales. You can give your product this big competitive advantage for less than a penny and a half per case. (Based on fortifying a twenty-four 12 oz. bottle case with the full daily requirement of Vitamin C in each bottle.)
- It's a smart sales move to enrich flour, macaroni, corn meal and similar products with Pfizer BI-CAP® enrichment concentrates. They give such products more food value. Let Pfizer show you how BI-CAP can add sales appeal to your product.
- To fortify your sales position in the canned fruit juices, fruit juice blend and frozen concentrate market, fortify these products with Pfizer vitamins. "Vitamin Fortified" on your label is a strong sales inducement. What's more, your vitamin content is standardized to offset processing losses and seasonal variations.

**What's the most powerful appeal to the food shopper?**



## *Answer*... Her family's health!

*Here's how to put it in and on your package!*

● There's something very basic about the grocery business that's so simple and true that it's often overlooked. More vital to the *permanent sales position* of your food product than all the temporary give-away promotions is *the fundamental desire of every homemaker to provide her family with the maximum in health-giving nourishment.* That's why Pfizer's vitamin fortification and enrichment program fits in so well with any contemplated improvements in your product. Your Pfizer sales representative is prepared to give you full details on how Pfizer vitamins can powerfully increase your product's sales potential. Remember that Pfizer has been a major vitamin research and production center since the first vitamin was commercially produced.

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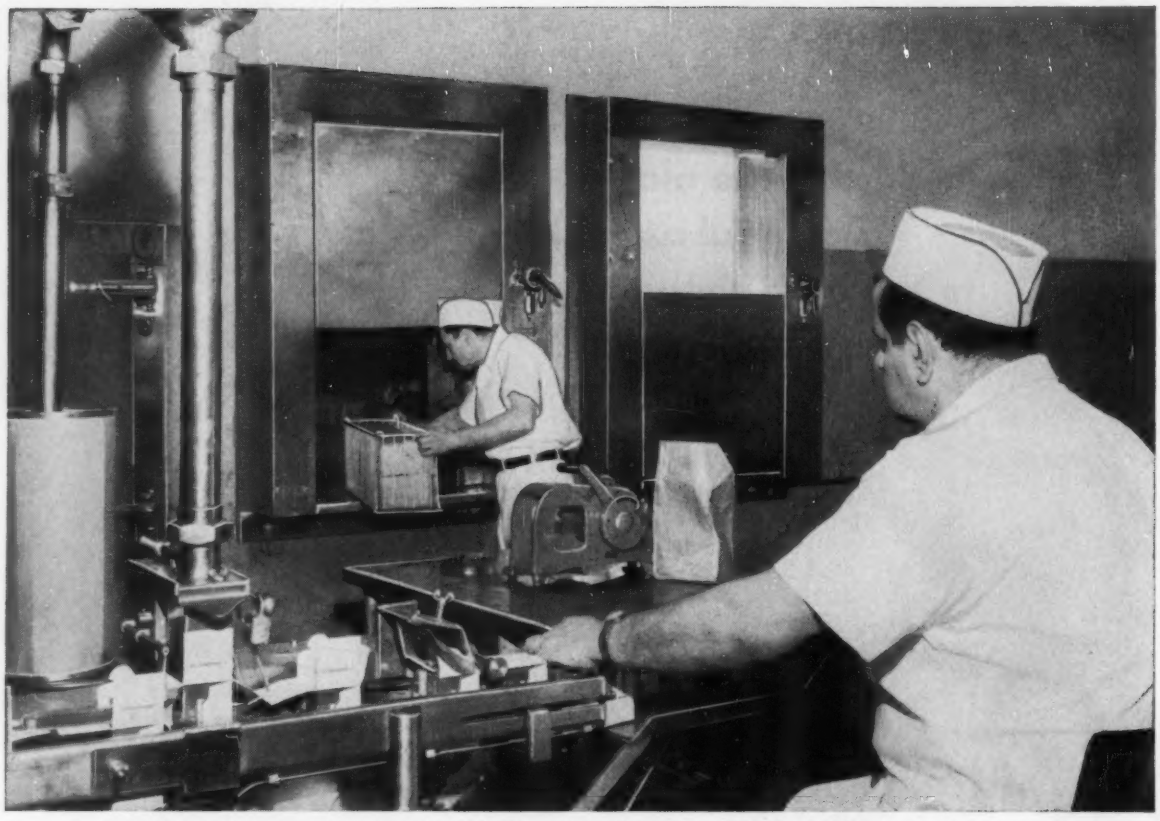
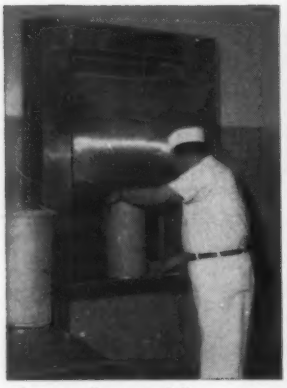


**To accelerate production** and streamline operations, the Harwill Ice Cream Co., Cleveland, Ohio has installed two of Jamison's new Power-Operated Vertical Sliding Doors that save space and refrigeration.

# Jamison doors set the pace in modern handling methods...

Fast opening and closing doors now make it possible to incorporate production line techniques into various handling operations. Gleaming stainless steel provides easier cleaning, promotes greater sanitation.

Modern Jamison Cold Storage Doors are designed to solve problems in all types of installations and are available in many types and sizes. For quick, practical help with your problem, contact Jamison today.



**Frostop feature** delivers controlled heat to gasket contact area to prevent freezing shut.

**Rapid opening and closing** saves refrigeration, permits quick pass-through.

*More* JAMISON Doors are used by *more* people than any other Cold Storage Door in the world.

**JAMISON**

COLD STORAGE DOORS

Jamison Cold Storage Door Co., Hagerstown, Md.

### Dehydrocanned Apples Are Big Space Savers

This product is a modification of canned apples in which prepared slices are dried to half their original weight before packaging. They are stable for one year at 70 F., but browning occurs at 90 F.

Preliminary experiments showed that, when performed prior to drying, sulfiting caused discoloration of cans and product; blanching produced an inferior product, and reduction of oxygen content by soaking did not prevent $O_2$ uptake during or following drying. Loose filling allowed corrosion of cans and browning of slices. Internal browning was caused by accelerated drying.

In packaging, cans were overfilled, using a stainless steel collar. Overfill was forced into can by a plunger, and in some cases sucrose syrup with ascorbic and citric acids was added to fill the interstices.

Maximum vacuum was used within limitation of cans which, after sealing, were immersed in boiling water for 5 min., then cooled. Successful trial commercial packs were made in two plants.—*Food Tech.*, 417-19, Aug. 1958.

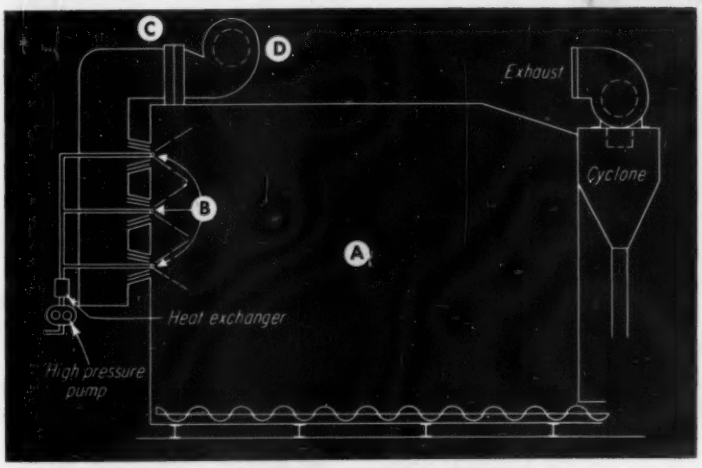
### Potato Chip Frying Oils Unaffected by Use

Change in iodine value has been proposed as a simple method for determining whether thermal polymers were formed in heated oils such as those used for frying potato chips.

However, a nation-wide survey of oils used on a continuing commercial basis in production of potato chips showed an average decrease of 1% in iodine value although they were free of thermal polymers.

In tests for: Melting point; degree of unsaturation; fatty acid composition; free fatty acid content, crystallization and other properties, differences between fresh and heated oil were not sufficient to influence wholesomeness of oil absorbed by the chips.

Likewise, constancy in composition between fresh and heated oil, particularly with respect to essential fatty acid content, removes any question regarding nutritive value of the heated oil.—*J. Amer. Oil Chem. Soc.*, 271-76, June 1958.




## Milk Powder's Improved Dispersibility Is Object of This New Spray Dryer

Novel features of a patented process for spray-drying milk are: (1) heating the drying medium to an unusually high temperature, and (2) controlling and graduating its temperature and velocity in the region of the fluid spray so as to obtain maximum effectiveness.

Resulting product is a coarse powder of improved quality and dispersibility.

Equipment comprises an evaporating chamber (A), where one wall has a plurality of spray nozzles of novel design (B). Each nozzle has a supply conduit, tipped with a spray jet concentrically disposed within an air nozzle. Latter is formed of conical sleeves dividing it into 3 annular concentric passageways.

Supply conduit is connected to a high pressure pump and heat exchanger delivering concentrated milk at 130-170F. and a nozzle pressure of 4,000 psi. Air nozzles are connected by a manifold to a heater (C) and centrifugal blower (D).

Special feature of air nozzle is installation of an electrical resistance heating unit in the sleeves whereby drying medium moving through innermost passageway may be heated to a higher temperature than air passing through outer passageways.

This construction makes it possible to control and graduate air temperature, directing hottest medium to region of spray carrying highest moisture content, and the lower temperature medium to the region of lesser moisture content. This results in a higher rate of evaporation without scorching the product.—U.S. Patent 2,835,597, May 20, 1958.

### Sweetening Before Freezing Doesn't Help Fruit Flavor

Experiments with Marshall strawberries, Montmorency cherries, and Elberta peaches frozen for later manufacture, indicated that sweeteners added before freezing did not improve the preserves.

Thirteen different treatments were applied to the fruit to be frozen. Used were sucrose, dextrose, Frodex, lactose, and combinations thereof in various fruit: sweetener ratios. After freezing and storage for 3 and 6 months fruits were examined for drained weight and color, and a number of cans were processed into preserves.

A panel of 120 untrained student judges was used to evaluate the different preserves according to flavor preference and acceptability. Although a dislike was shown for Fro-

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## Advances in Technology

dex treated strawberries, (4:1 ratio) after 3 months' frozen storage, no preference or dislike was shown for any treatment after 6 months' storage.

With cherries, no preference was shown for any treatment after 3 and 6 months' storage. With peach preserves, made from fruit after 3 months' storage, the Frodex cap ranked higher than all other treatments. After 6 months, however, it ranked lowest. Preserves made from unsweetened fruits ranked above the grand mean for each storage period. —*Food Tech.*, 393-97, Aug. 1958.

### Less Nutrients in 'Blotchy' Than in Normal Tomatoes

Irregular or defective ripening of tomatoes is a major quality defect in many parts of the world, but the cause of it remains unknown. It is accompanied by discolored blotches or waxy patches on the fruit.

During 1954 and 1956 paired comparisons of normally ripened and blotchy-ripened fruit were made on the variety Potentate. Significant differences in composition were found.

Normal fruit and juice were higher in total solids, reducing sugars, titratable acidity, nitrogen, and potassium content, and the pH values were lower than for the blotchy-ripened samples.

Despite the significant differences, there was no indication of any critical values, below which it could always be stated that the fruit was of the blotchy ripened type.—*J. Science of Food & Agri.*, 9(8), 493-98, 1958.

### Artificial Chocolate Flavor

Whole milk is preferred source of reagents which, when reacted under suitable conditions of time and temperature, will yield a flavor base having the butyral notes or scents of milk chocolate.

It can be used in combination with other factors to provide an artificial chocolate flavor, or to enhance the flavor of natural chocolate products.

Reaction is carried out in 2 steps: (1) Hydrolysis of milk fat (preferably with lipase) to split off free fatty acids having fragrant butter acids, and (2) drying at 250-300F., preferably in spray dryer.

In the process, whole milk is digested at a pH of 7 or higher


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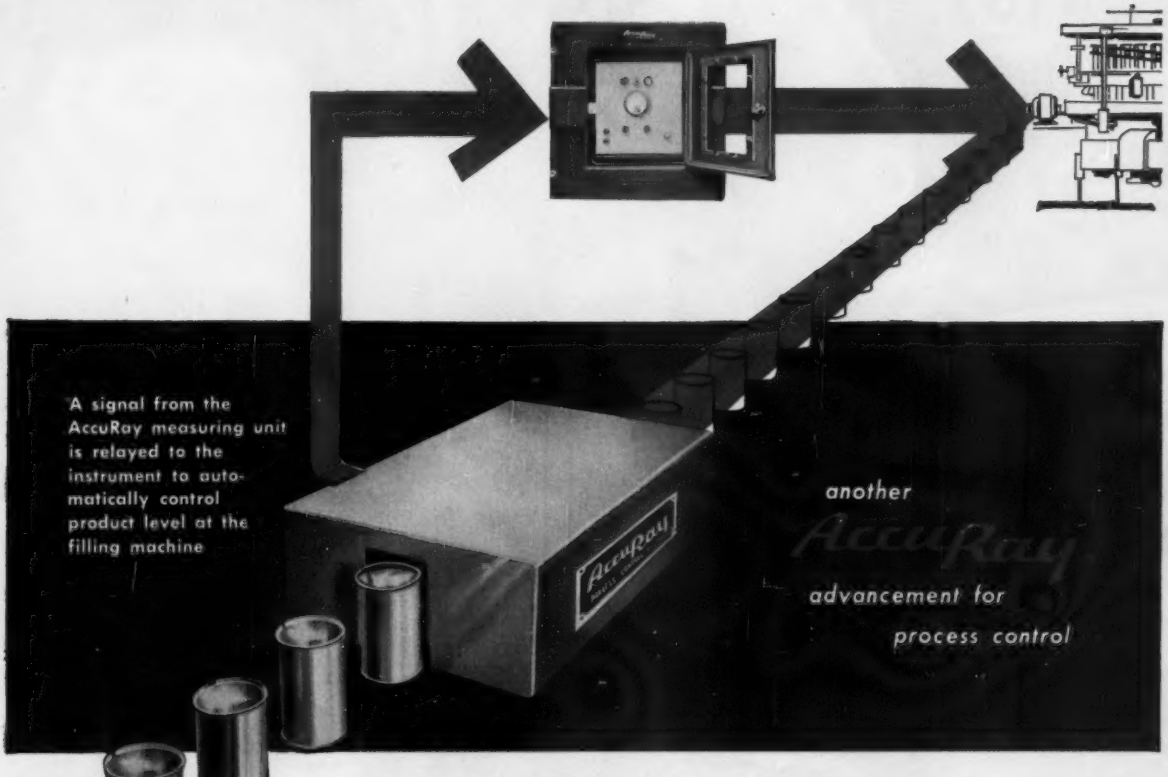
# AccuRay... FILL CONTROL SYSTEM

**New Container Fill Control System Provides Continuous, Accurate Fill Level Control**


A signal from the AccuRay measuring unit is relayed to the instrument to automatically control product level at the filling machine
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Now for the first time in the canning industry, a system offering the ultimate in complete feedback control of container fill . . . the AccuRay Fill Control System. Unmatched for economy, ease of installation and maintenance, the system will measure and control average container fill to ±1/64 inch. Based on a reduction in fill of only 1/32 inch per 16 oz. can at a filling rate of 300 cans a minute, AccuRay will save the equivalent of 135 cans an hour. With a product cost of just 5c per can, the AccuRay System will pay for itself in less than 8 weeks. The system consists of a compact, splash-proof, stainless steel measuring unit, containing a small radiation source suspended over the conveyor line, and a wall or panel-mounted control instrument. A motor coupled to the machine adjustment shaft automatically increases or decreases fill when average level is off specification. By maintaining constant accurate target fill, AccuRay has closed the loop between measuring unit and filling machine.

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and temperature of about 120F. until 8-20% hydrolysis is obtained (with the enzyme pancreatin, approximately 10% hydrolysis is obtained in 6-hr.). Milk is heated to inactivate enzyme, then fed to the spray dryer where air is introduced at 465-480F. This dries and roasts the digest in one operation.

Dried roasted product should have a tan color, and be soluble in milk, or water.—U.S. Patent 2,835,593, May 20, 1958.

## Preventing Fat Bloom

Fat bloom in chocolate goods is not always explainable on the principle of passage of cocoa butter crystals from the three metastable states to the stable beta-form.

Fatty fillings in chocolates are known to influence the formation of bloom on coatings, hence it is probable that *composition* of fat is the determining factor. This has been demonstrated by determining the phase diagram for the seven glycerides of cocoa butter fat.

No bloom should occur on cocoa butters whose composition is outside the metastable regions of this diagram, and experimental chocolates made from appropriate fractions, remained free of bloom for over a year when stored at 75F. If candy filling contains a fat which promotes bloom, its formation can be avoided by incorporating some of the center fat in the coating, though in experimental preparations, amount of fat required has been rather large, over 10%.

Enclosing the center in an edible layer that is impermeable to fat is a possible solution. Using cuts of cocoa butter obtained by fractional melting, and combining these with the center fat is another possibility. —*Int. Choc. Review*, 13(6), 246-49, 1958. (In French and German.)

## Dry Ready-to-Bake Pie

Preparation of a dry fruit pie that can be stored for several weeks and, when properly prepared for consumption has all the desirable qualities of a freshly prepared fruit pie, is the object of a patented process.

Product comprises a dried and partly baked lower crust, dried filling material, and dried upper crust with a central opening through which water may be added to rehydrate contents prior to baking. Formula for the pie crust contains a sub-


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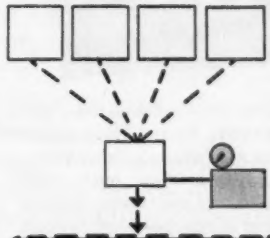
*Simply dial the formula and mixing times, select number of batches, and press start button. Any number of ingredients are automatically fed, weighed, mixed and discharged.*




No need for expensive, complex custom installations. Howe engineers *standard* Batchmaster systems tailored to *your* operation. Guarantees proper batching for most critical formulas. Cuts operating costs. Provides better control of material costs. Rugged construction for extreme operating conditions. You have a *different* batching problem? Send for detailed booklet illustrating the Batchmaster solution.

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THE HOWE SCALE CO. · RUTLAND, VERMONT

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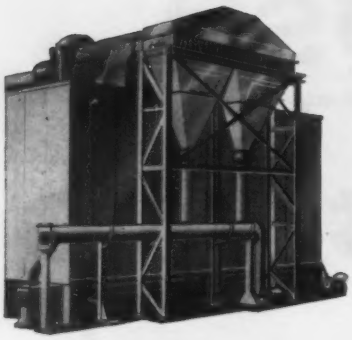

leading manufacturers* of dehydrated food products insist on the

**DUSTEX MICROCLONE**

at the end of a spray dryer

MICROCLONE cast tubes with smooth interior surfaces provide a cling-free, self-cleaning action to assure maximum material recovery, and allows the dryer to operate at maximum designed production rate—*continuously*. There's no time or place for "cooking"—hence, peak flavor...greater solubility.

THE ALL METAL MICROCLONE is protrusion free—meets the highest sanitation requirements. There are no moving parts, no filters to clog, no sludge to pump. It's virtually maintenance free!

LOW INSTALLATION COST and up to 99.8% efficiency makes the MICROCLONE the leader of the field.

**Name on request*

*Write today for this free folder explaining the technical characteristics of the "quick opening" Microclone.*

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Dustex CORP.

For more data, circle 313 on Reader Service Card

USS **Cyclone Metal Conveyor Belt**

saves its own purchase price for dog food processor

**Because this Cyclone Processing Belt completely eliminated the need for manual handling of dog biscuits, the resulting savings paid for the belt installation in a short time. Now the dog biscuits are automatically carried from ovens to crushers.**

More details on this time- and money-saving story are reported in the Cyclone booklet, "How 35 Manufacturers Saved with USS Cyclone Processing Belts." Send coupon for your free copy.

**Five Basic Belt Types**—Cyclone Fence makes the greatest variety of belts in the industry—spiral woven chain drive, spiral woven friction drive, flat wire friction drive, flat wire sprocket drive and flex-grid. They are available in a variety of metals, alloys and finishes. They are strong, sturdy, highly resistant to the effects of chemicals, oils, water or temperatures. Their open-mesh construction makes them readily cleaned and sanitary—permits good circulation of air or heat.

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## Advances in Technology

stance, such as sodium caseinate, to retard moisture penetration. The pie is formed and baked in an aluminum foil container.

Lower crust is placed in the aluminum foil container and dried to about 5% moisture in a 350F oven. A layer of granulated starch (5 g.) is then sprinkled on it. For apple pie, a 15 g. layer of sugar foam is next placed on the starch. This is covered with dried apple pieces containing not more than 5% moisture.

Dry flavoring ingredients are sprinkled over the apples, and top crust is put in place and sealed at edges to lower crust. To prepare for consumption, contents are hydrated by the addition of hot water, then pie is baked. The sugar foam collapses and liquefies, providing room for the expansion of the rehydrated apples.—U.S. Patent 2,836,498, May 27, 1958.

### Increasing Use of Plastics In Dairy Industry Seen

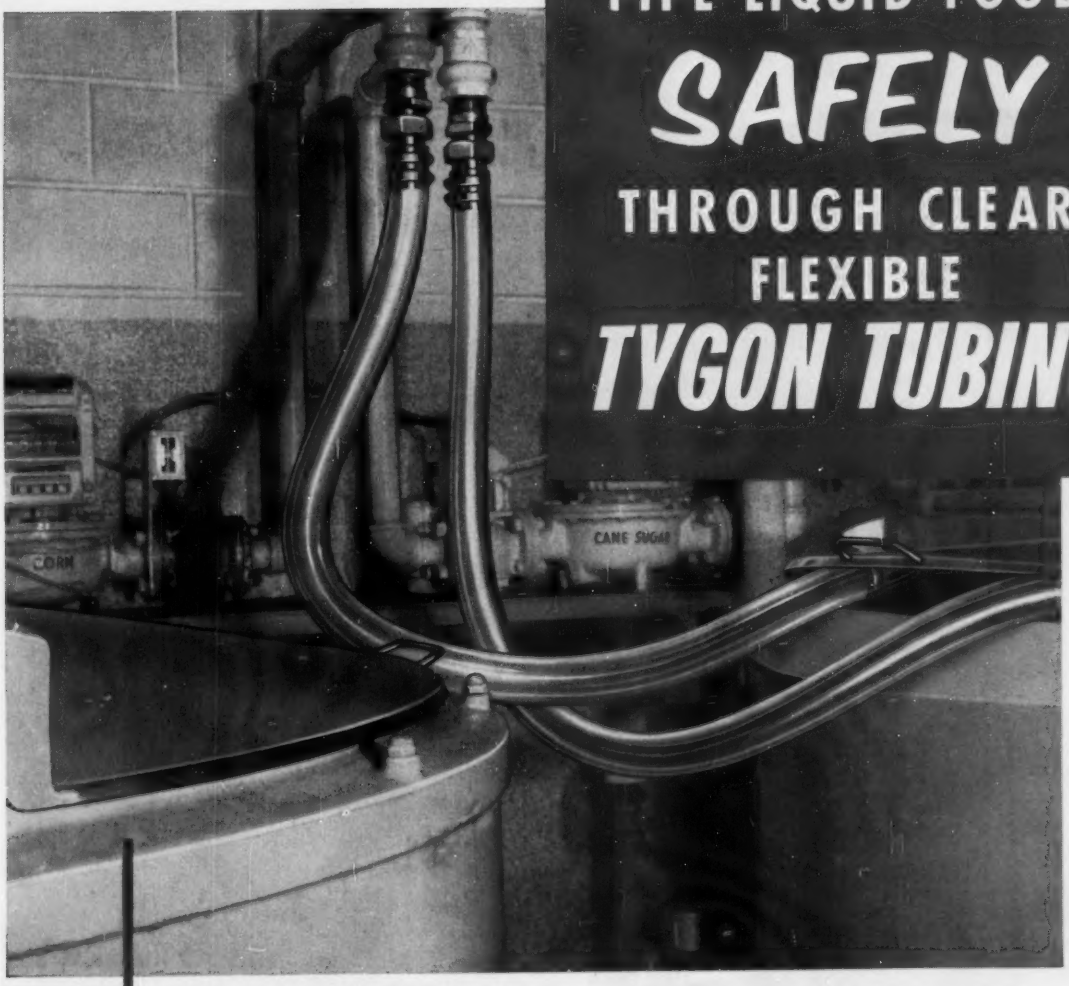
Future use of plastics in the dairy industry will probably be in processing equipment and not in packaging. Primary requisites for such use would be nontoxicity, or nonadulteration of the food product. Others would be resistance to chemical change, impact and abrasion, strength, surface finish and, in addition, dimensional stability under temperature changes.

Thermoplastic and thermosetting plastics possess these properties in varying degree, and the determining factor in their selection will often be the heat resistance of thermosets versus the temperature susceptibility of thermoplastics.

Nylon, for example, will be useful where abrasion, erosion, and impact strength are factors. The acrylics will be useful in applications requiring glass-like clarity. Vinyls offer widest range of use, although limited in temperature resistance and cold flow under compression. The fluorocarbon plastics have unusually high resistance to chemicals of all types and to elevated temperatures. Of equal importance is the method of fabrication. Here economics plays an important role in mold design and cost.

Although steel, glass, and porcelain enamels are successfully used in dairy processing equipment, plastics offer some advantages. Chief among them are light weight, lower cost, possibilities of clarity or color, and avoidance of corrosion.—*J. Milk & Food Tech.*, 215-22, Aug. 1958.

# PIPE LIQUID FOODS SAFELY THROUGH CLEAR, FLEXIBLE TYGON TUBING




Less expensive than stainless steel, Tygon flexible-plastic Tubing combines the best features of both rubber and glass, without the disadvantages of either. It is the ideal piping medium for handling liquid food products.

Tygon Tubing gives you the solution visibility of clear glass, without the danger of breaking. It gives you the flexibility of rubber without the danger of contamination. Light in weight, strong, abrasion resistant, Tygon Tubing can go from "anywhere to anywhere" with fewer fittings, less assembly time.

A Tygon line can be dismantled, cleaned and re-assembled quickly. Tygon can be steam sterilized, or chemically cleaned.

Tygon is a registered Trade Mark of The U. S. Stoneware Co.

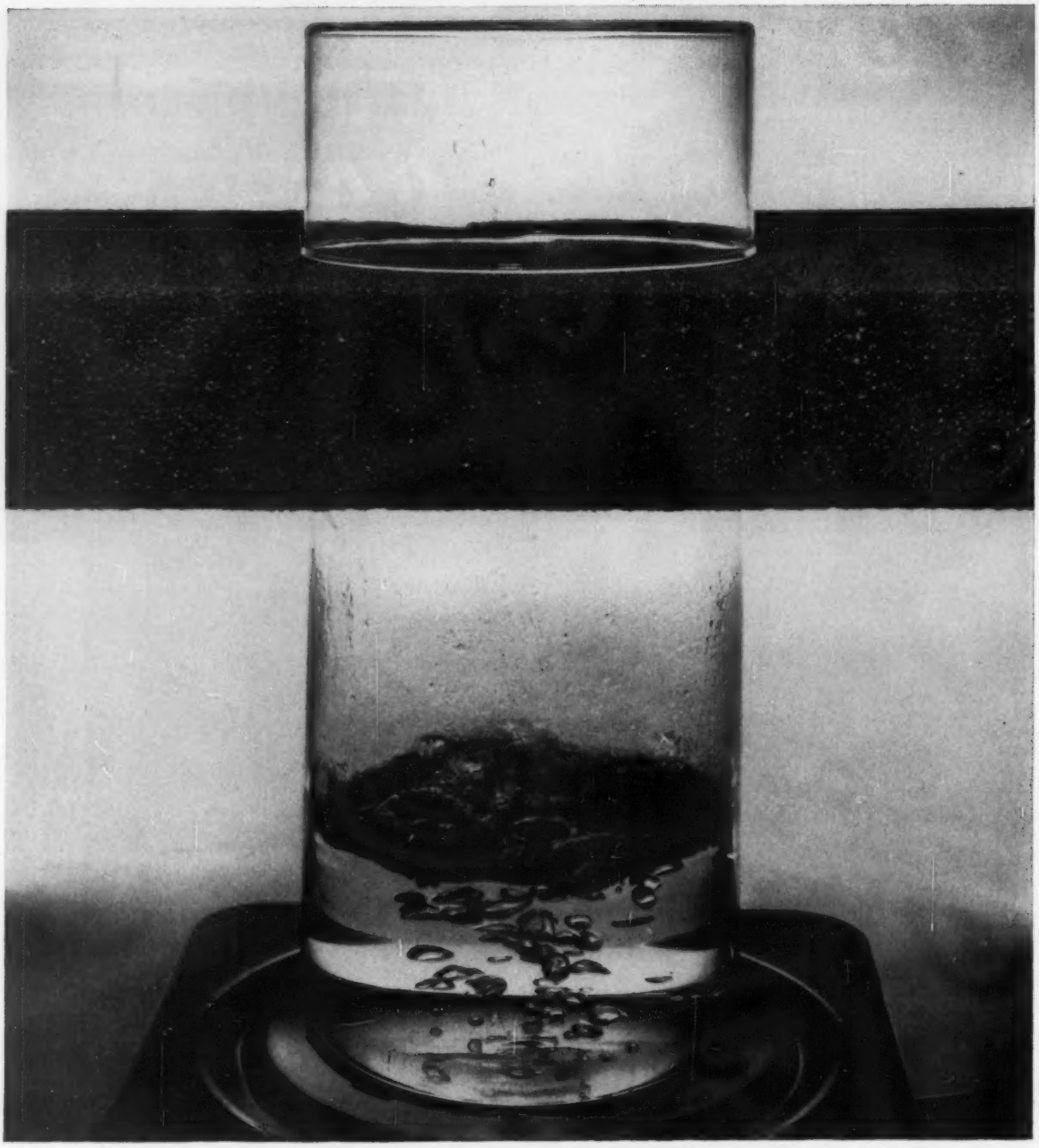
Tygon Tubing comes in continuous lengths, and in bore sizes from ⅛" to 3". For full technical data write for Bulletin T-97.

177-F

U. S. STONEWARE
AKRON 9, OHIO




For more data, circle 315 on Reader Service Card



...always an insulation investment; never an insulating expense

# FOAMGLAS® IS VAPOR-PROOF

Water vapor is the biggest threat to any insulation's thermal performance. It is present in nearly every situation requiring thermal insulation. Most insulations absorb vapor. When they do, the vapor can condense within the material . . . and turn the insulation into a conductor of heat. Eliminate this threat. Use Pittsburgh Corning FOAMGLAS. Its sealed glass cells can never absorb or transmit vapor (see above) . . . thus guaranteeing long lasting insulating value that never fades from its original high level. There's still more to this insulation investment story. FOAMGLAS is dimensionally stable . . . can't burn . . . unusually strong . . . acid-proof . . . vermin-proof . . . easy, economical to handle and install. Write for our latest literature. PC Glass Blocks are another outstanding building product of Pittsburgh Corning Corporation.

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# Nash Instrument Air Compressors deliver only clean air, free from oil or dust, and without filters

## *Here is Why!*

You can dispense with oil filters and dust filters when you install ®Nash® Clean Air Compressors. You can save the cost of maintaining these devices. You can greatly reduce instrument maintenance costs. For the Nash employs no internal lubrication, therefore no troublesome oil is in the delivered air. Moreover, air from a Nash is thoroughly washed and cooled as it passes thru the pump. Dust in the plant atmosphere, even fly ash, is immediately removed.

®Nash® Clean Air Compressors are simple, with only one moving element. No valves, gears, pistons, sliding vanes, or other enemies of long life and constant performance complicate a Nash. No aftercoolers are needed. You will find it profitable to investigate these pumps, now.

**No oil filters.**
**No dust filters.**
**No internal lubrication to contaminate air handled.**
**No internal wearing parts.**
**No valves, pistons, or vanes.**
**Non-pulsating pressure.**
**Original performance constant over a long pump life.**
**Low maintenance cost.**

# NASH ENGINEERING COMPANY
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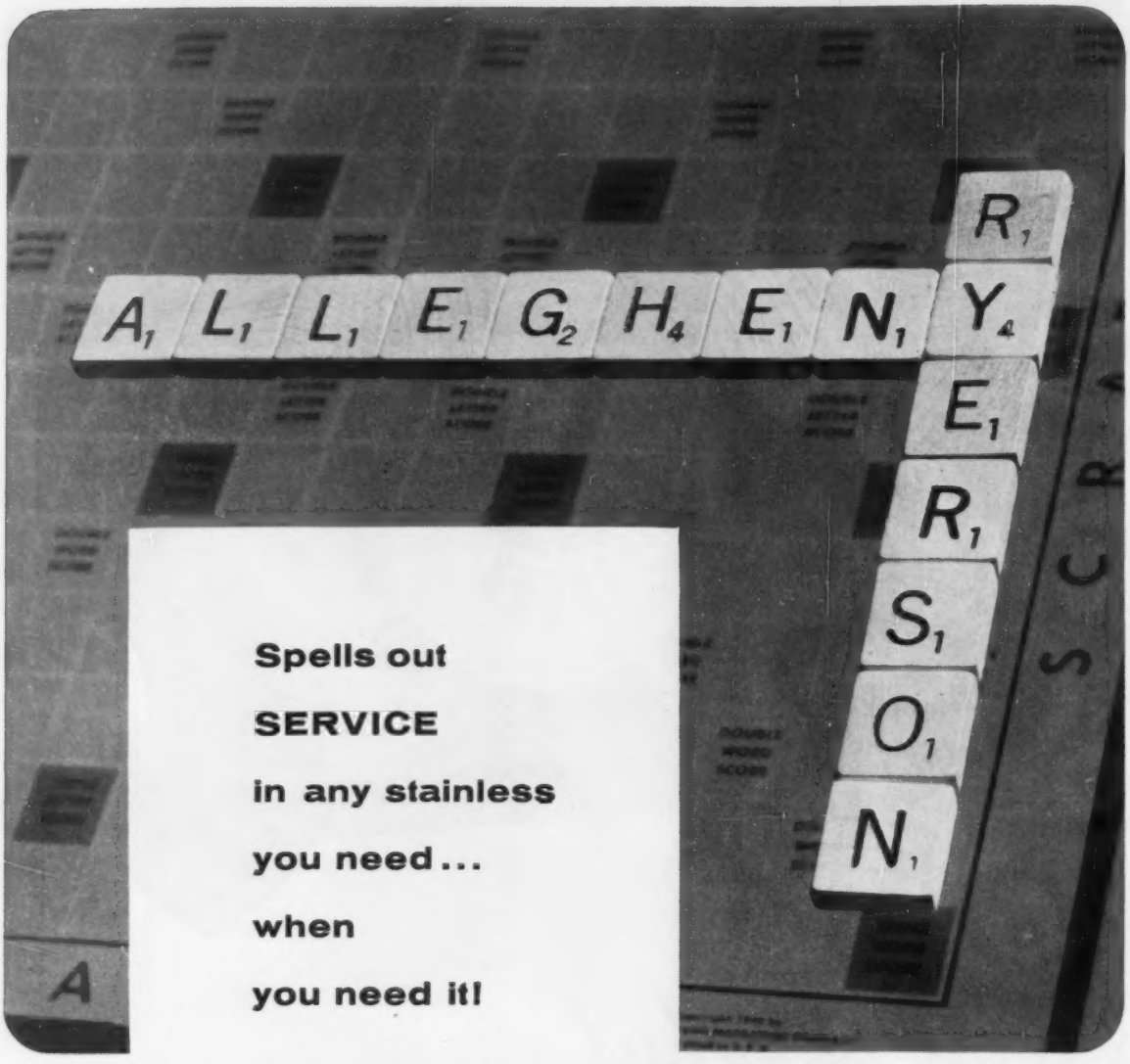
***Experience**—the extra alloy in **Allegheny Stainless***




You can win only when you buy Allegheny Stainless from Ryerson. Two top names are teamed to give you quality stainless, the fastest way possible!

Allegheny Ludlum is the leading producer of stainless steels in all forms. Ryerson is recognized as the top steel service center. It's a team to bring you the best quality stainless, quick, when you need it.

Ryerson now stocks 2,351 shapes, sizes, finishes and alloys of Allegheny Stainless. It's the most complete line of stainless anywhere! And Ryerson takes the inventory cost from you, gives you as quick service as your own stockroom.

Whether your order is for Allegheny Stainless sheet, plates, bars, or whatever, Ryerson has it in stock. Trained salesmen and technicians to help in selecting or in fabricating are at your beck and call.

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EVERY FORM OF STAINLESS . . . EVERY HELP IN USING IT

Dr. Roy E. Morse

**Busy Rutgers** . . . What's ahead for food science at Rutgers U.?

Dr. Roy E. Morse, new chairman of department, gives the following fast rundown:

"Major emphasis on project headed by Dr. Olin Ball on cold storage of HTST processed foods . . . Study of improved handling and marketing of fresh fruits and vegetables by new staff members Drs. Robert Di Marco and Arnold Epstein . . . Continued studies on curing and packaging of meats . . . And a new series of studies on freeze drying meat."

Succeeding Dr. Walter A. Maclinn, now exec. director of Refrigeration Research Foundation, Dr. Morse has long been active in process development. Cited is his work on "flash" rendering of fats (FE Nov. '52, p. 72) and electrostatic smoking (FE Sept. '53, p. 70).

Before joining Rutgers in '55, he held research director posts at Kingan & Co. and Wm. J. Stange Co.

**Why Spend** . . . "Capital expenditures are made in anticipation of constantly increasing earnings," observes General Mills, Inc.

Word from recent directors' meeting is that GM's spending for plant and equipment currently runs ahead of last year's $15,858,711. Profits were up over '55-56. Sales topped record for 8th yr., hitting $529,820,000. Report so far in '58-59 is that trend is still up.

G. S. Kennedy

Selected at the meeting to fill newly created post of exec. v.-p. is G. S. Kennedy, who joined GM in 1914. He has been a v.-p. since '43, and a director since '48.

Howard G. Dick

**"Unprofitable Products"** . . . Balance sheet of Minute Maid Corp., which had been riding the roller coaster, is showing "dramatic" improvement, according to President John M. Fox—in part, because "products unprofitable for MM" were eliminated by franchising Snow Crop line to Seabrook Farms, Inc. (Nov. '57).

Sales are down for year ended Oct. '58—from $102,806,775 to $99,500,000. But earnings move from red (last year's loss of $2,542,903) to black (est. $4.5 million).

New v.-p. at MM's sales & marketing tiller is Howard G. Dick. With the company since '46, he's held posts in production, purchasing, and sales, and since last year has been director of advertising and marketing.

STEPHENS-ADAMSON

*Food Slice*

SEPARATING MACHINE

This unique machine was especially designed to separate not only pickle ends and seeds from the slices, but for similar separating service on any sliced food product.

The sliced product is fed directly from the slicer onto a vibrating screen deck. Due to the vibration, introduced by an eccentric drive, the slices move along the screen deck with undersize and broken pieces falling through to a flat bottom trough. Slices of proper size move along on the screen deck and discharge to the production line. Material falling through the screen deck is conveyed along the trough and falls to a removable container for disposal.

Almost any sliced materials may be efficiently separated by choosing the correct mesh for the screen deck. The Trough and Scalping Screen may be constructed of No. 304 Stainless Steel or of any other type of Stainless specified by the customer.

• ELIMINATES HAND LABOR • INCREASES CAPACITY • IDEAL FOR USE WITH URSCHEL MODEL "O" or "OV" TRANSVERSE SLICERS • HELPS YOU PACK ONLY COMPLETE FOOD SLICES • SAVES TIME AND MONEY

*WRITE TODAY FOR BULLETIN 657*

STANDARD PRODUCTS DIVISION

STEPHENS-ADAMSON MFG. CO.

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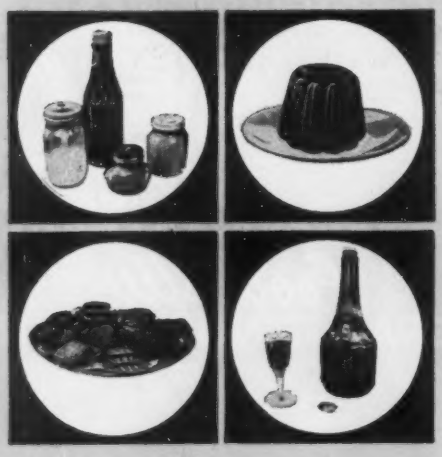

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*We offer*
*the best!*
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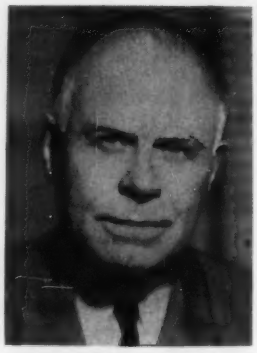
**More Room at the Top . . .** With sights set on expansion, McCormick & Co., Inc., "will require extra manpower in the general administrative area," says Chairman Charles P. McCormick.

Tapped for post of asst. to president is Philip B. Schnering, who has been exec. v.-p. at Curtiss Candy Co.

Mr. McCormick cites Mr. Schnering's "broad experience in general management." And President John N. Curlett emphasizes, "We seldom bring in outside executives at McCormick—unless they are highly specialized."

Mr. Schnering, who began as a retail salesman at Curtiss 20 yr. ago, will keep some association with Curtiss interests, and will continue as a director of the company.

**Philip B. Schnering**



**Dr. Roger H. Lueck**

**R&D Liaison . . .** American Management Assn. has picked Dr. Roger H. Lueck, of American Can Co., as v.-p. of its r&d div.

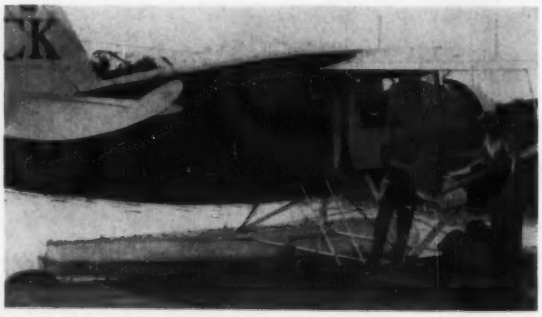
He will head the "voluntary planning council" that meets regularly to advise AMA on the association's r&d "menu."

Canco's research v.-p. is probably best known to food men for his work on "C" enamel coating, preventing sulfide discoloration, back in the days when canners were still sweating out fundamental "keeping" and metal pickup problems. He is a member of the Institute of Food Technologists.

Also serving on the council is Pillsbury's V.-P. Paige Lehman.

**Harvey Beffa,** exec. v.-p. of Falstaff Brewing Corp., and once a victim of polio, is honored this month by members of the food-serving business for his "long career of public service." Proceeds of testimonial dinner in St. Louis will go to City of Hope National Medical Center for its all-free program.

**H. C. "Dutch" Diehl,** recently retired director of Refrigeration Research Foundation, has become managing direc-



**Chun King,** of Duluth, airlifts wild rice from 700,000 acreage in Manitoba, Canada. Big crop plus improved processing and marketing techniques will cut price a minimum of 20%, CK predicts. Estimated 1.7 million lb. U.S.-Canadian total is forecast vs. last year's scanty .5 million lb.

SPROUT-WALDRON Pointers

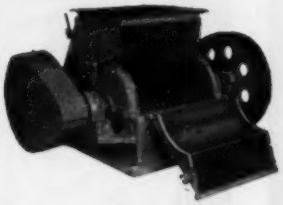
for Mixing and Blending • Size Reduction
Size Classification • Bulk Materials Handling • Pelleting and Densifying

Published in the interest of better processing by Sprout, Waldron & Co., Inc., Muncy, Penna.

## PHENOLIC STOCK REDUCED IN SAW TOOTH CRUSHER

The reduction of calendered sheeting for phenolic molding compounds is being accomplished in a single pass through a heavy duty Sprout-Waldron saw tooth crusher. The warm material comes to the crusher in strips 6" to 9" wide, 12" to 18" long and in a variety of thicknesses. It is reduced to approximately ½" square pieces.

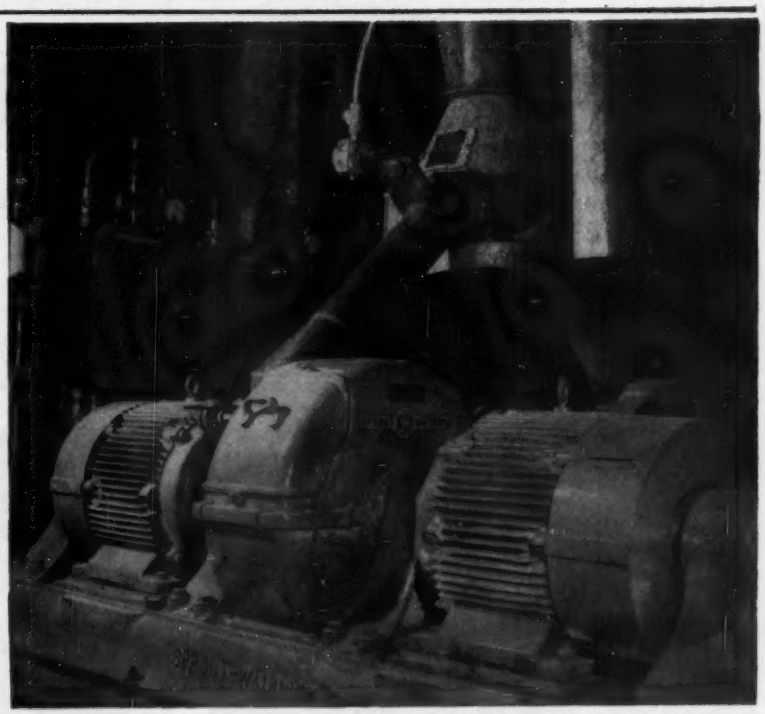
This precision-built heavy duty 16 x 25 Saw Tooth Crusher has been in successful operation at the General Electric Company plant in Pittsfield, Massachusetts for over 10,000 working hours, and it is still going strong. Its hard faced 16" diameter breaker saws are designed specifically for the reduction of tough or brittle materials. In fact, everything about this crusher suggests high productivity under the most demanding conditions. Here are some of the key design points:



*This Sprout-Waldron 16 x 25 Heavy Duty Saw Tooth Crusher has given more than 10,000 hours of satisfactory service in the crushing of phenolic stock at General Electric.*

1. Precision-built.
2. Hinged covers to facilitate inspection or servicing.
3. Rugged construction. Alloy steel round shafts, mounted on large roller bearings.
4. Close fitting shrouds to prevent material by-passes.

For details, request Advance Specification Sheet No. 204.



## STREAM SPLITTER KEEPS ATTRITION MILLS ON THE RUN

A few years ago the American Distilling Company installed a 26" Sprout-Waldron double runner attrition mill for the grinding of corn, milo, rye, barley malt and other ingredients used in the production of Bourbon Supreme Whiskey, corn and rye whiskeys and grain neutral spirits. The mill discharged into a mechanical handling system consisting of a screw conveyor and bucket elevator.

As the need for expansion became obvious it was decided to install an identical Sprout-Waldron attrition mill to operate in parallel with the existing machine, providing greater flow rate, reduced wear and simplified maintenance.

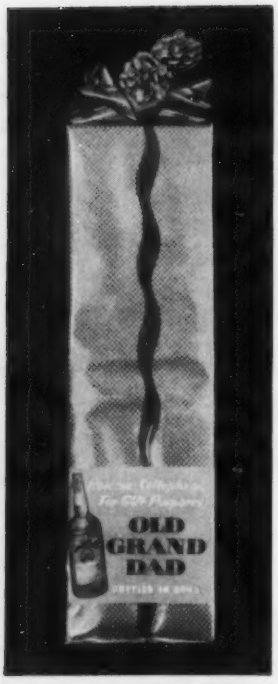
The key to the new system is a Sprout-Waldron Model VA-5 stream splitter with two outlets which divides the flow equally between the two attrition mills. Four whole grain storage bins discharge to a common Sprout-Waldron 12" x 18' screw conveyor. The center outlet of the conveyor allows the grain to pass over a magnetic separator on the way to the stream splitter. As the ground grain emerges from the attrition mills it is conveyed to the roof of the building by a Sprout-Waldron 50 hp 44" Pneu-Vac negative pressure system to another ground grain storage bin where it is held for further processing into quality whiskeys. For the facts on the Sprout-Waldron line of precision stream splitters, ask for Bulletin 137-B

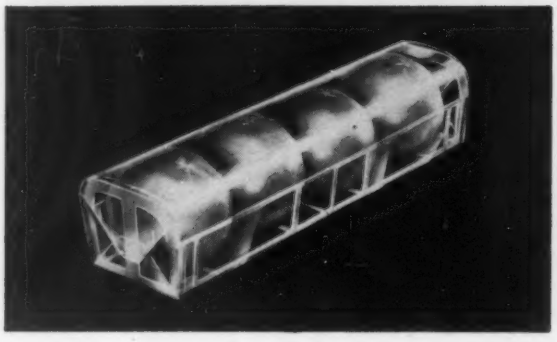
CP/106

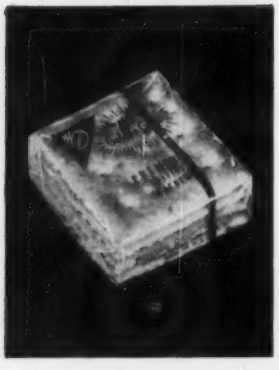


For more data, circle 321 on Reader Service Card

# Is yours more than
# 'JUST A PACKAGE'?







If you hope to remain competitive today, you must have more. These packages do! Here is everything from major merchandising triumphs to the combination of eye appeal with high-speed, fully-automatic, cost-cutting production. But none were easy decisions.

Few management problems cut across as many areas as your packaging. Merchandising, product protection, production, cost control, shipping—all are involved. They make a packaging decision important to your profit picture. They also warrant consideration of more than just machinery to do the actual work.

Package Machinery offers you the broadest selection of automatic equipment available today. And, through its Reed-Prentice Division, a complete line of injection molding machines for the growing plastic container field. Your Package representative will be glad to tell you about this line of equipment, and how you can use it to add a competitive edge to your packages.

***PACKAGING IS PART OF YOUR PROFIT PICTURE***

**PACKAGE MACHINERY COMPANY, EAST LONGMEADOW, MASSACHUSETTS**

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**PACKAGE**

PMMI

tor of Trans-American Refrigerated Services, Ltd.

**Charles F. Mayer,** president of H. J. Mayer & Sons, Inc., Chicago, has been awarded 25-yr. service pin of American Meat Institute.

## Industry

**Armour & Co.** now provides its livestock buyers in Chicago stockyards with two-way radios. They permit immediate checking with the company's head buyer for quick purchase of top-grade animals—ahead of competition.

**Campbell Soup Co.** has taken option to purchase 500-acre site near Paris, Tex., for possible future food processing plant.

**Carling Breweries, Ltd.,** will begin building new $15 million plant on 50-acre site just west of Toronto. Completion is expected early in 1960.

**Cook Chocolate Co.,** Chicago, has signed lease for erection of a new plant in Campbellford, Ontario.

**Florida Citrus Commission** has begun series of 12 trade luncheons, designed to "sell" its plans for $5 million advertising and merchandising program to an estimated 1,000 retailers, wholesalers, brokers, and distributors in North America.

**Kitchens of Sara Lee, Inc.,** will centralize all production in new $2 million plant now under construction—expected to be in operation early next year.

**Pillsbury Co.** will embark on million-dollar-plus expansion of its production facilities at Springfield, Ill. Plant there is firm's largest. Built in 1930, it has grown from a one-product flour mill with annual payroll of $460,000 to a multi-operation that shells out $5.7 million yearly to employees.

## Associated Industries

**Continental Can Co.'s** projected streamlining of its Hazel-Atlas Glass Div., includes upping production, more than double, of the division's newest plant at Plainfield, Ill.; and closure of an "outmoded" plant in Grafton, W. Va., and the older of two plants in Zanesville, Ohio.

**De Laval Separator Co.'s** Gordon A. Houran has been elected president of National Assn. of Dairy Equipment Manufacturers.

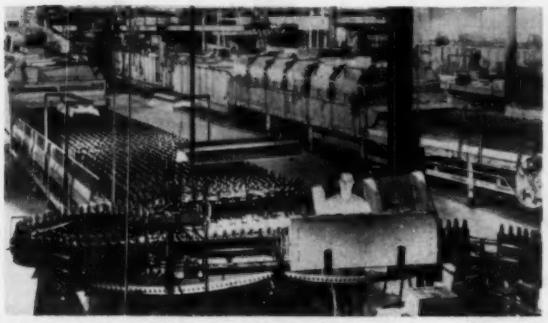
**Diamond Alkali Co.** plans to build a multi-million-dollar, campus-style research center on an 800-acre tract south of Painesville, Ohio.

## Deaths

**Lee L. Aughnay,** 64, v.-p. of Glaser Beverages, Inc., Seattle, and president of Bremerton Bottling Co., Bremerton.

**Dr. Geoffrey A. Boyd,** 63, recently retired chief of Calif.'s Bureau of Meat Inspection.

**John Morrell Foster,** 63, former president of John Morrell & Co.



**"Flavor-Guard" bottles** (see p. 26) emerge from annealing ovens at new $6 million glass plant of E. & J. Gallo Winery, Modesto, Calif. Per diem "appetite" of 13-acre facilities is 235 tons of glass-making materials. Entire 24-hr. output goes to Gallo, said to be "first winery to have its own bottle factory." Firm also has built new $1 million warehouse, covering about 6 acres.

Six King Sharp Freeze units have been installed at Carnation's milk and ice cream processing plant in Seattle, Washington.

King systems feature fast, economical, simple air defrost . . . each unit is defrosted once or twice a week . . . 20 to 30 minutes defrosting time required. King Sharp Freezing Systems are designed to maintain maximum capacity during the entire interval between defrosting periods . . . thus no reduced capacity from heavily frosted coils.

**7500 square foot hardening room** has King Sharp Freeze units located on one side of the room with a specially designed air distribution system.

Write today for further information.

King COMPANY OF OWATONNA

sharp freeze, cooling, ventilating and heating systems

905 No. Cedar St. • Owatonna, Minn.

Manufacturers of

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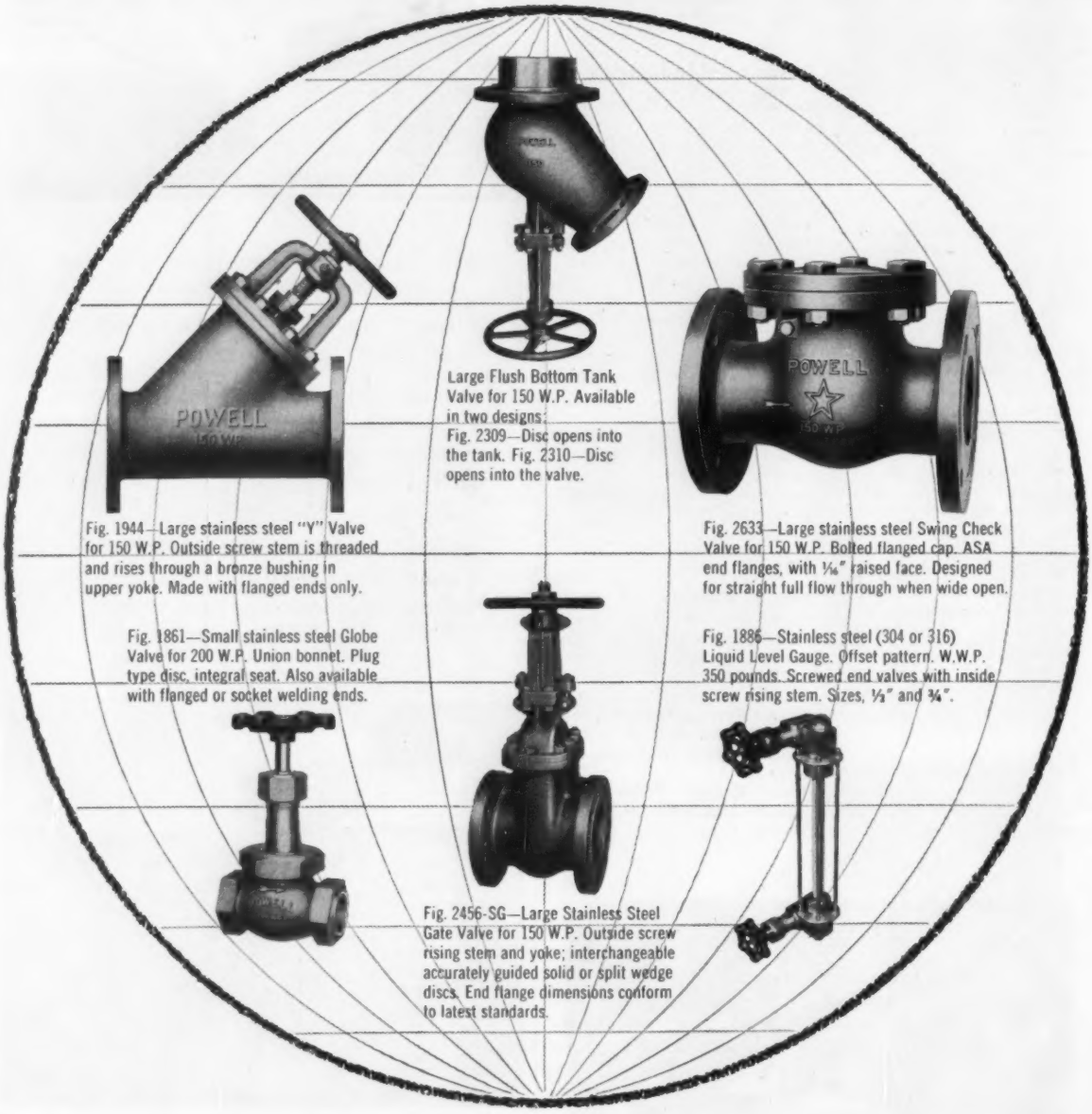
# POWELL

## world's largest family of valves




Large Flush Bottom Tank Valve for 150 W.P. Available in two designs: Fig. 2309—Disc opens into the tank. Fig. 2310—Disc opens into the valve.

Fig. 1944—Large stainless steel "Y" Valve for 150 W.P. Outside screw stem is threaded and rises through a bronze bushing in upper yoke. Made with flanged ends only.

Fig. 2633—Large stainless steel Swing Check Valve for 150 W.P. Bolted flanged cap. ASA end flanges, with 1/16" raised face. Designed for straight full flow through when wide open.

Fig. 1861—Small stainless steel Globe Valve for 200 W.P. Union bonnet. Plug type disc, integral seat. Also available with flanged or socket welding ends.

Fig. 1886—Stainless steel (304 or 316) Liquid Level Gauge. Offset pattern. W.W.P. 350 pounds. Screwed end valves with inside screw rising stem. Sizes, 1/2" and 3/4".

Fig. 2456-SG—Large Stainless Steel Gate Valve for 150 W.P. Outside screw rising stem and yoke; interchangeable accurately guided solid or split wedge discs. End flange dimensions conform to latest standards.

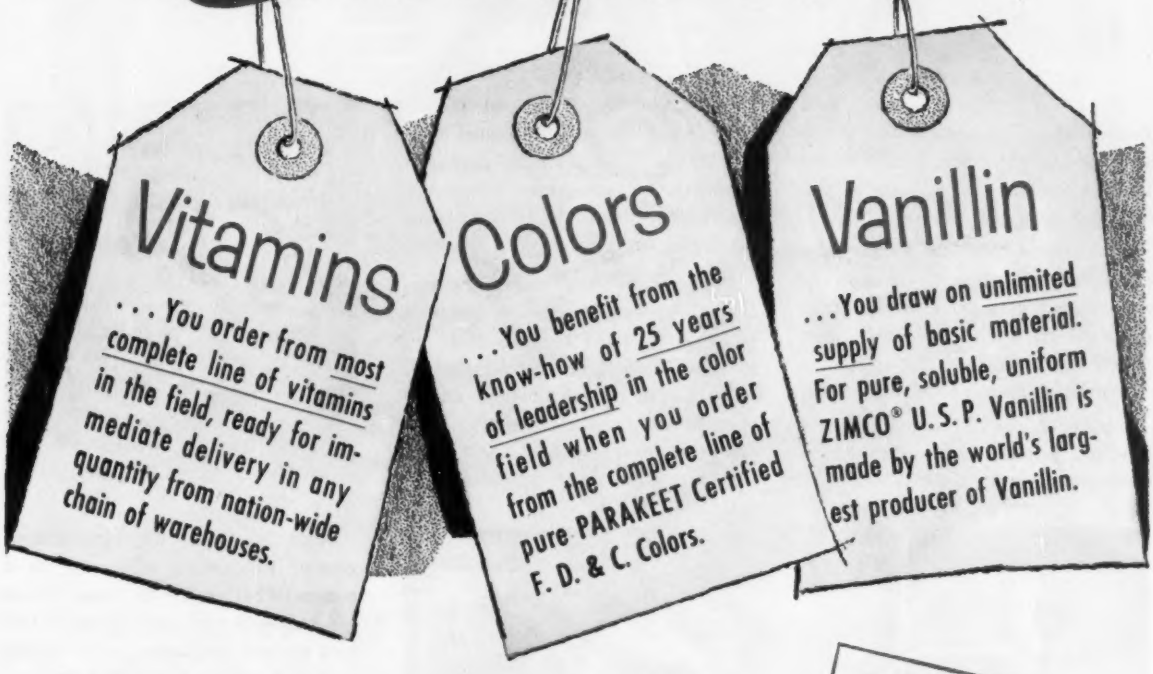
**A solution for every kind of flow control problem** is as near as your local Powell distributor. Powell valves are designed and engineered in the largest variety of metals and alloys, to handle any medium, every flow control requirement. There are Powell distributors in all principal cities. Or, if yours is a special engineering problem, write to:

**THE WM. POWELL COMPANY** • *Dependable Valves Since 1846* • **Cincinnati 22, Ohio**

# You get these Extras

## Only when you buy—

# Sterwin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. . . You order from most complete line of vitamins in the field, ready for immediate delivery in any quantity from nation-wide chain of warehouses.
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. . . You draw on unlimited supply of basic material. For pure, soluble, uniform ZIMCO® U.S.P. Vanillin is made by the world's largest producer of Vanillin.

When you buy from STERWIN you get more than the world's finest food ingredients. STERWIN Technically-Trained Representatives stand constantly ready with years of technological and practical experience to help you solve your food production problems.

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**Stop your sanitizing problem with ROCCAL® by Sterwin**

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**Sterwin Chemicals INC.**

Subsidiary of Sterling Drug Inc.

**1450 Broadway, New York 18, N.Y.**

# CARNATION MAKES MILK MAGIC

• New instant crystals packaged on Pneumatic equipment

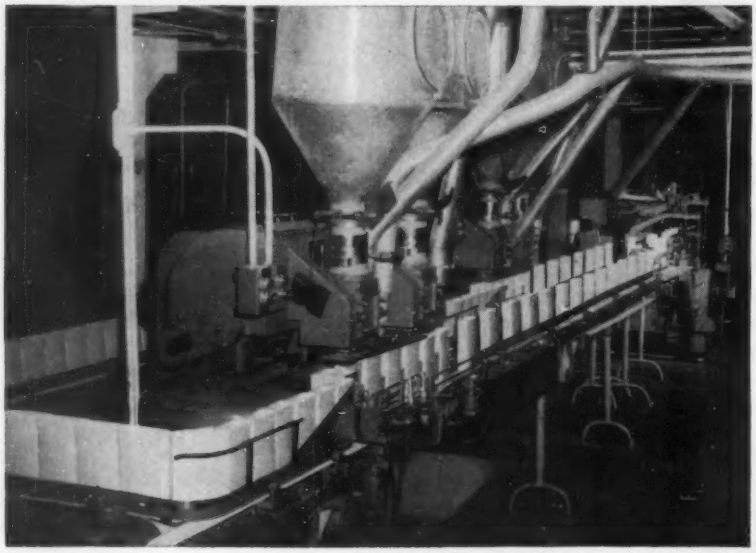
The latest type of nonfat dry milk bears, naturally enough, one of the greatest and most progressive names in milk and allied products of this day and age — Carnation.

Carnation's long time slogan "from contented cows" now includes its new magic crystals that produce delicious nonfat milk instantly — when added to water. Pour, stir and serve — that's all there is to it.

Carnation's packaging of its new product is made easy, efficient and economical by its use of Pneumatic carton forming, filling and sealing equipment. Like countless other leading volume producers of packaged products Carnation uses Pneumatic machines in the highly important packaging function.

Pneumatic's "lower cost per container" operation repeats itself in plant after plant because it is an inevitable result of sounder design, more advanced engineering and a type of precision construction that has never been perfected to the same high degree by other machine makers.

With the present day emphasis on greater production efficiency as a means to better profits, many plants are taking a new and more critical look at their packaging and bottling, to weed out costly obsolescence. There's almost always a better way with Pneumatic equipment.



**Weighing and top closing operations of fully automatic packaging line in Carnation's plant at Oconomowoc, Wisconsin.**

PNEUMATIC SCALE CORP., LTD.,
91 Newport Ave., Quincy 71, Mass.
*Also: New York; Chicago; Dallas; San Francisco; Los Angeles; Seattle; Leeds, England. Canadian Division: Delamere & Williams Company, Ltd., Toronto.*

★PNEUMATIC

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Catalogs ..... p. 143
Books ..... p. 147
Patents ..... p. 149
Classified ..... p. 153
Advertisers' Index ..... p. 156
Reader Service ..... p. 158


## NEW EQUIPMENT & SUPPLIES

### 'Scaled-Down' Unit Economizes Multi-Stop Deliveries

Designed for efficient multi-stop delivery of light, bulky loads, this smallest American truck of its type offers low initial cost and definite operating economy. In addition, it reportedly incorporates basic body lines and features of maker's larger units without sacrificing style, driver comfort, or load accessibility.

Known as Metro-Mite, this forward-control model (AM-80) weighs only 2,800 lb., is rated at 3,800 lb. GVW, and has a 1,000 lb. (200 cu. ft.) payload capacity. Power is supplied by a new 51-hp., 4-cylinder engine. And unitized all-steel construction eliminates separate frames for chassis and body, which enables a strong, box-like unit.

Load working is facilitated by sliding side doors and 38-in. double rear doors. Short engine compartment permits a 28-in.-deep walk-through aisle between doors. And a bucket-type sponge-rubber seat tilts forward for load working through left side door. Large glass area, shackle broad-leaf springs, and front and rear shock absorbers boost driver comfort and safety.

Wheel base is 96 in., overall length is 159 in. Interior height and width are both 66 in. Loadspace from back of driver's seat to rear doors is 84 in.

Teamed with new engine, which greatly extends gas mileage, is a 4-speed synchromesh transmission whose low gear is required only for severe grades, and a hydraulically-controlled 8-in. clutch. — *International Harvester Co., 180 N. Michigan Ave., Chicago 16.*

**Want More Information?**

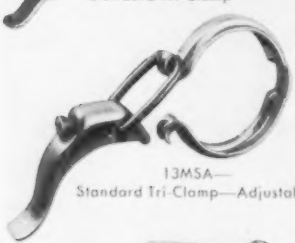
**It's free—and easy to get. Simply note here the items on which you want more details, then circle each key number (there's one at the bottom of each item) on the handy Reader Service Postcard—back of book. Then sign your name and address and mail. For your convenience, too, these items are listed and keyed in the Reader Service Section.**

*For New and Existing TRI-CLAMP Installations . . .*

# TRI-CLOVER now offers 5 Tri-Clamp types for permanent "CIP" and "Take-Down" lines

*13 MHLA—Hinged Tri-Clamp—Adjustable.* Assembly of joint utilizing this clamp is facilitated by hinge shown in close-up. Also note adjusting screw built into toggle locking device. Provides added assurance of positive leak-tight joint.

13MS—
Standard Tri-Clamp



13MSA—
Standard Tri-Clamp—Adjustable

13MHH—
Hinged Tri-Clamp—Heavy Duty

41UC—
Pressure Tri-Clamp—Adjustable

Six years ago, Tri-Clover Division introduced Tri-Clamp,® an entirely different concept of sanitary fitting design and fabrication. This new idea in sanitary piping offered quick, easy installation, longer fitting life and appreciable savings over conventional assemblies.

A continuing program of research and development has resulted in an expansion of this now popular line. Today, you can choose from five different Tri-Clamp types . . . for *all* your Permanent "CIP" and "Take-Down" sanitary lines. These new, improved Tri-Clamps are fabricated from Type 304 stainless steel and are available in 1", 1½", 2", 2½", 3" and 4" O.D. tube sizes. (1" ferrules and fittings utilize 1½" clamp assembly.)

A better-than-ever buy for new installations, the new designs are completely interchangeable with *any* Tri-Clamp now in service . . . regardless of age.

Like all Tri-Clover sanitary valves, fittings and pumps, Tri-Clamps are fabricated from highest quality materials by experienced craftsmen . . . to give you the ultimate in service. For the complete Tri-Clamp story, write for new Catalog 1-159.

*See your nearest TRI-CLOVER DISTRIBUTOR*

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S-958

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SEE OUR EXHIBIT AT THE 1958 DAIRY SHOW

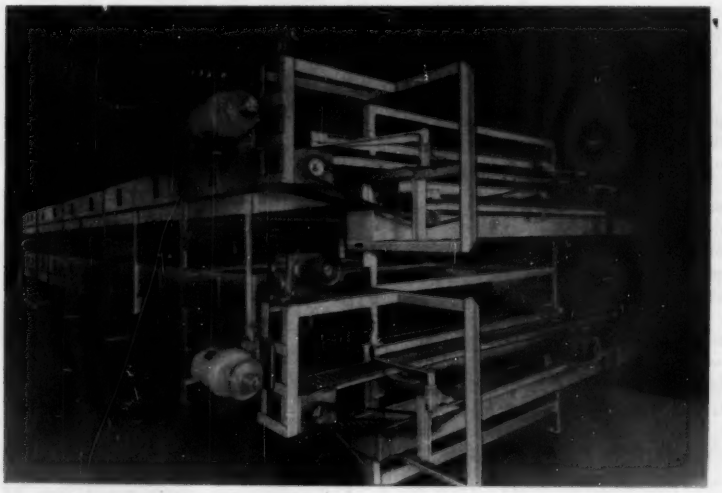
## Inspects 1,000 Containers/Min. for Proper Fill

This conveyor-line monitor transmits harmless nuclear rays through opaque containers to check for proper fill to within $\frac{1}{32}$ in.

Called Indicon 1-200, it gages up to 1,000 containers per min. (cans, glass, cartons, or drums), and handles liquids, solids, and semi-solids.

The electronic detector employs an isotope source with 5-year life, and can actuate a reject mechanism.—*Nuclear Corp of America, 2 Richwood Pl., Danville, N. J.*

Circle 17 on Reader Service Card



## Double-Deck Unit Washes, Cools, Dries Filled Cans

Designed for maximum production in limited floor space, this double-deck unit cools and washes filled containers, then dries them for subsequent labeling and casing.

Separate controls for upper and lower compartments enable operating both decks either simultaneously or independently. Add-on sections may be bought separately.

In operation, filled and capped containers enter cooler on conveyors, then are washed with a fine water spray that also cools by evaporation. Finally, cans are air-dried by blowers.—*Standard Metal Products Co., 123 N. Racine Ave., Chicago.*

Circle 18 on Reader Service Card

## Plastic Cells of New Battery Are Individually Replaced

Higher performance and longer service life are reported advantages of a unique car battery with air-cooled cells that can be replaced individually. Thus, it is not necessary to scrap this unit when only one cell is defective.

Known as "Cellomatic", it employs non-porous polystyrene cells in a polyethylene frame. Separate-cell construction permits free flow of cooling air to combat overheating, a major cause of battery failure. And use of selenium in the electrolyte curbs shedding of active plate material, also permits faster charging at lower temperature.—*Scranton Battery Corp., Scranton, Pa.*

Circle 19 on Reader Service Card

## For Humane Slaughter: Pneumatic Stunner

Reportedly the first air-powered animal stunner, this unit is designed for humane slaughter at virtually no operating cost.

Known as Thor, it is an automatic repeater-type penetrating tool. Contact-activated unit stuns up to 125 cattle an hour, and may be adopted for hogs, calves, and lambs.

In operation, tool drives a penetrating pin to correct depth for instaneous unconsciousness and relaxed breathing, which improve carcass quality. Unit weighs about 8

Ingredients p. 142
Chemicals p. 142
Briefs p. 142

← For more data, circle 327 on Reader Service Card

# Emery NEWS

## WEIGHING SYSTEM

BIN, TANK AND HOPPER EDITION No. 10

Covering design, development and application data on Emery Weighing Systems for industrial applications.

# ANNOUNCING THE NEW WAY-PAC* LINE OF LOW-CAPACITY LOW-PRICE PACKAGED SYSTEMS FOR TANK WEIGHING

## SIMPLICITY OF SELECTION AND OPERATION IS KEY FEATURE OF SUPPLEMENTARY LINE

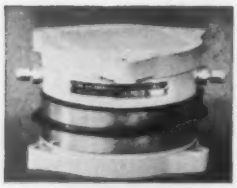


FIG. 1 TYPE AC-1 CELL COMPRESSION.

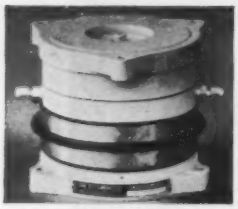


FIG. 2 TYPE AC-1 "ROLLING-BALL" CELL.

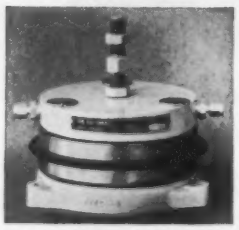


FIG. 3 TYPE AD-1 CELL DYNAMOMETER.

FIG. 4 TYPE AT-1 CELL TENSION.

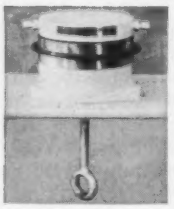


FIG. 5 TYPE AU-1 CELL TENSION.

The WAY-PAC, a new line of Emery low-capacity, low price packaged hydraulic tank weighing systems, designed specifically for the 0 to 1000 lb. range, is now being offered to the process industries.

The accuracy of the WAY-PAC cells is ¼ of 1% of range. This extreme accuracy depends upon two significant design features . . . a moulded rubber diaphragm which maintains a constant acting area and a rolling ball assembly which performs the dual function of practically eliminating friction in the "piston-cylinder" assembly as well as preventing deleterious pinching of the diaphragm in the event of cross loading.

Five different cell types are available in the WAY-PAC line, each designed to perform with typical Emery excellence under different sets of operating conditions. (See Figs. 1 to 5).

The cells are manufactured of aluminum and a top grade bar stock steel to eliminate any possible leakage of the film of oil sealed in the diaphragm.

Unique design features, coupled with the ultimate in manufacturing craftsmanship, have produced in the WAY-PAC line equipment capable of long service life with extreme accuracy under the most rigorous conditions.

A complete line of related equipment is available including: tank pivots, strut assemblies, indicators and recorders. Although controlling and printing equipment can be supplied with and can be operated from the WAY-PAC cells, it is desirable that our engineers know the details of the installation in order to make a recommendation.

*Trademark

### Moulded Rubber Diaphragm Gives Constant Acting Area

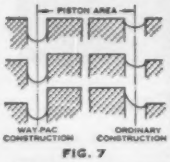



FIG. 7

The moulded rubber diaphragm used in the WAY-PAC cells possesses a unique "rolling action" which imparts constant acting area to the cell. This "rolling action" is illustrated in Fig. 7.

Because of this constant "rolling action", the Emery WAY-PAC load cell is extremely and consistently accurate.

### Exclusive "Rolling Ball" Head Available in WAY-PAC LINE

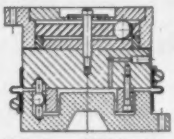


FIG. 6 CROSS SECTION OF "ROLLING-BALL" CELL.

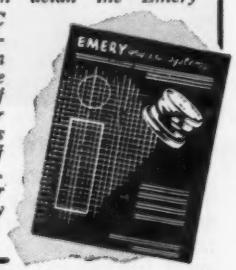
To prevent damage from possible crosswise movement of the tank, bin, hopper or structure being weighed, we have incorporated into the WAY-PAC cell line the exclusive Emery "rolling ball" head.

In essence, the WAY-PAC "rolling ball" head consists of three ½" diameter stainless steel balls built into the top platen of the cell, riding top and bottom on hardened steel plates. (See Fig. 6). In operation, any crosswise movement, such as that incurred in the expansion and contraction of the structure being weighed, rides on the stainless steel balls and is transmitted through them to the diaphragm.

Load cells which do not take expansion and contraction into consideration are not properly designed and cannot compare with the WAY-PAC.

### NEW WAY-PAC BULLETIN 582 AVAILABLE FOR DISTRIBUTION

*Our new Bulletin 582 which describes in detail the Emery WAY-PAC line and provides an easy-to-use method of figuring your system costs is now off the press. Send for your copy right away.*




THE A. H. EMERY CO. PRECISION SINCE 1872 FORCE MEASUREMENT

## THE A. H. EMERY COMPANY

Pine Street • New Canaan, Conn.

lb. and is 30 in. long. A 1¼-in.-dia. handle provides easy, accurate two-handed operation. Use of this tool qualifies packers for the Seal of Approval of the American Humane Assn.—*Thor Power Tool Co., 175 N. State St., Aurora, Ill.*

Circle 20 on Reader Service Card

## Vacuum Handling Unit Lifts 2,000-Lb Load

Attached to a lift truck, this vacuum handling unit is transporting four 55-gal. drums, each weighing 490 lb.

Power source is a hydraulic motor-driven vacuum pump that operates with truck's regular hydraulic system. Dashboard controls enable operator to lift or release containers collectively, individually, or in any combination. A green light flashes on control panel when unit's vacuum pads grip drums securely, indicating that they are ready for lifting and moving.—*Vac-U-Lift Co., Salem, Ill.*

Circle 21 on Reader Service Card

## New Pressure Switches Offer Versatile Control

Designed for liquid or gas pressures up to 3,000 psi., a new line of mercury switches operates alone as regulators, or with other instruments for limit alarm or signalling service.

Called "Pressuretrol", unit is actuated by a corrosion-resistant Bourdon tube, and is enclosed in a steel case with pressure settings located on the front. 'High' and 'low' knobs fix pressure differential over which switching action is to occur.

Switch position is visible through window in front of case, which may be surface-mounted, flush-mounted in a panel, or installed directly on a pipe.—*Minneapolis-Honeywell Regulator Co., Wayne and Windrim Aves., Philadelphia.*

Circle 22 on Reader Service Card

## Maneuverable Fork Truck Speeds Materials Handling

High lift speeds and new "bi-angular" steering for maximum maneuverability in rough terrain are reported advantages of this 4,000-lb.-capacity fork truck.

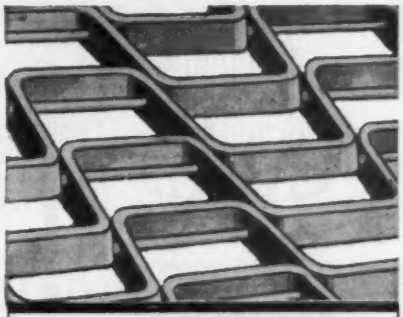
Called "Ranger 40", unit may be equipped with 2- or 4-wheel drive, and is termed well suited for handling duties in orchards. "Bi-angular" steering, a combination of standard Ackerman type and wagon-wheel steer, gives a short turning radius despite truck's relatively long wheel base.

Two convenient levers on steering post control lifting and tilting of upright. Lift speeds, loaded, range 100 fpm., truck speed is 23 mph. forward and reverse, and it will climb grades of 37-43%.

Maker also offers a 6,000-lb.-capacity model (Ranger 60).—*Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.*

Circle 23 on Reader Service Card


Wash • Drain • Cook • Freeze • Dehydrate Food Faster on:



LA PORTE
FLEXIBLE STEEL CONVEYOR BELTING

Whether you are Canning, Freezing, Dehydrating or Pickling, the open mesh construction of La Porte Flexible Conveyor Belting will save you time and money. Besides, it facilitates sterilizing with steam guns or scalding water, also provides a perfectly smooth surface for containers empty or filled. Cuts packaging and shipping costs, too.

For maximum service with minimum maintenance, specify La Porte Belting.

*Available in ½" x 1" also 1" x 1" mesh in any length and practically any width.*

*Ask your Mill Supplier or write for illustrated literature, prices.*

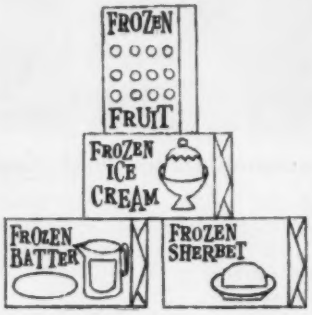
LA PORTE MAT AND MFG. CO.
BOX 124 La Porte, Indiana




For more data, circle 329 on Reader Service Card

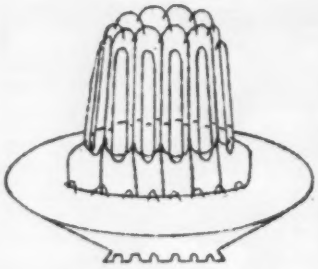
# Which of these algin uses best solves your processing problems?

Thickening



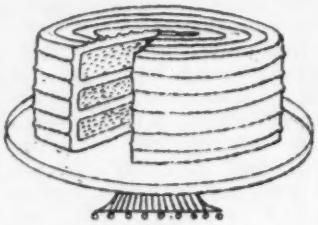

Stabilizing

Suspending



Gelling

Emulsifying



Coatings and Icings

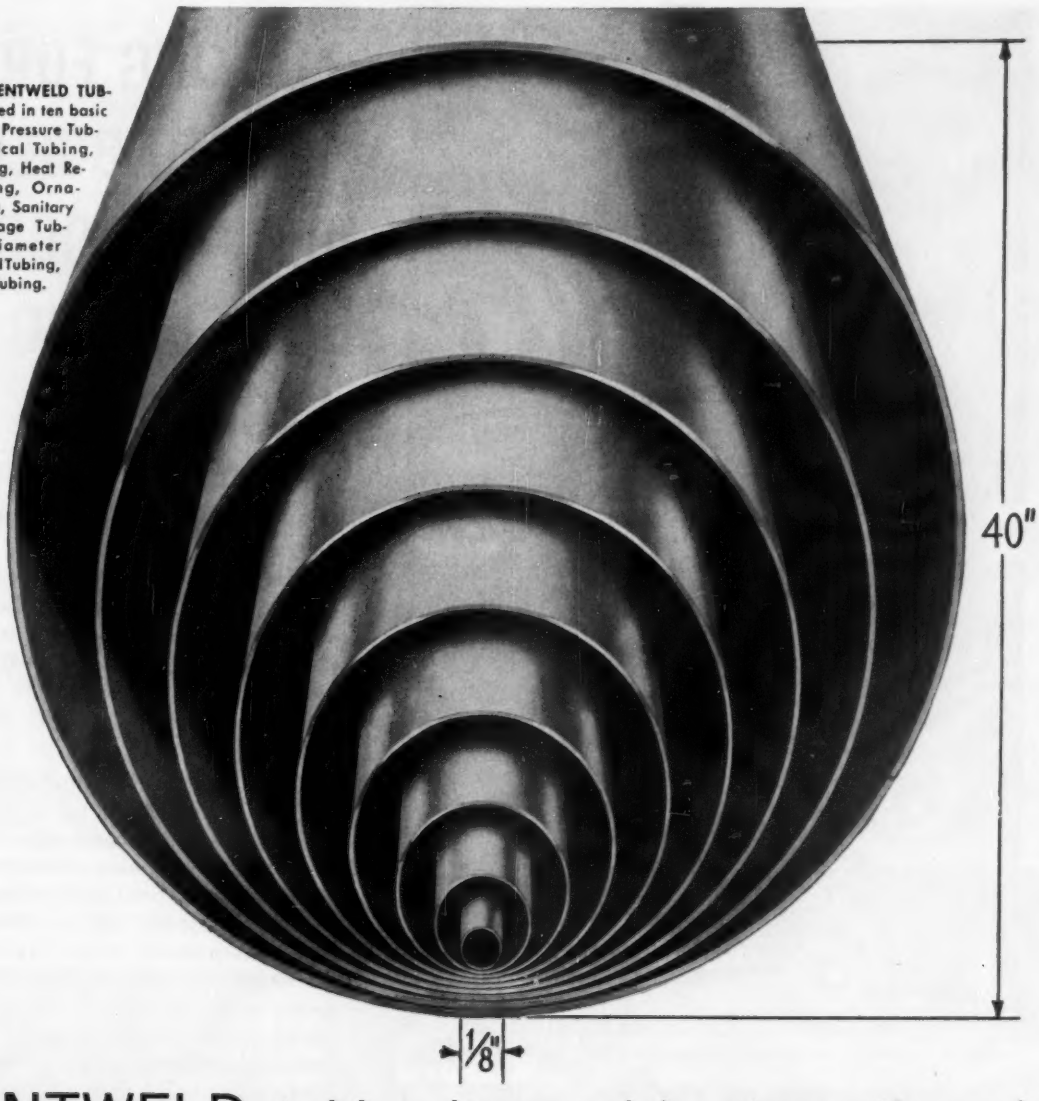
Unique and effective hydrophilic colloids, Kelco Algin products speed production and cut costs. Further, they improve your product's eye and taste appeal. They provide proper body and texture, reduce settling or separation, retain moisture in place.

Easy to use and readily soluble in hot or cold water, Kelco Algin products are providing the answer to diverse processing and production problems in many fields. If you have a problem in thickening, stabilizing, emulsifying or gelling, please contact us. The Kelco Company's technical staff is at your service, ready to recommend the right algin to solve your specific problem. Call or write your nearest Kelco regional office.

## Kelco Company

120 Broadway, New York 5, N. Y. 20 N. Wacker Dr., Chicago 6, Ill. 530 W. 6 St., Los Angeles 14, Cal. Cable Add.: Kelcoalgin — N. Y.

**CONTOUR TRENTWELD TUBING** is furnished in ten basic classifications: Pressure Tubing, Mechanical Tubing, Aircraft Tubing, Heat Resistant Tubing, Ornamental Tubing, Sanitary Tubing, Beverage Tubing, Large Diameter Tubing, Shaped Tubing, and Formed Tubing.




# TRENTWELD tubing is equal in strength and has more uniformity than tubing made by any other method of manufacture

Trent offers tubing in sizes ranging from ⅛" to 40" O.D. and in a wide range of grades. These include: Hastelloy,* Zirconium, Zircaloy, Titanium and 19-9-DL grades. All are made by an exclusive welding process—Contour Trentweld®—which virtually eliminates the bead. Furthermore, by cold working and annealing after welding, Trent makes the weld equal in strength and corrosion resistance to the parent metal.

To insure that Trentweld tubing is of the highest quality attainable, a rigorous quality control program is carried out. Samples of each lot are tensile tested. Periodic tests — flattening, reverse bend, flare and flange, coil, and pressure — are conducted. Rigid corrosion tests are made on all lots intended for corrosive applications. When requested, a unique "single-wall" X-ray inspection is made as your final assurance of a sound, uniform product.

Why not take advantage of Trent *quality* when you order stainless or high alloy tubing? For further information, write for the Trent tubing handbook, Trent Tube Company, East Troy, Wisconsin.

*Trademark of Haynes, Stellite Co.

CONTOUR TRENTWELD

**TRENT TUBE COMPANY**

Subsidiary of Crucible Steel Company of America

GENERAL OFFICES: EAST TROY, WISCONSIN
MILLS: EAST TROY, WIS.; FULLERTON, CALIF.



For more data, circle 331 on Reader Service Card

Dairyland Poultry Inc., Butler processing plant at Endeavor, Wisconsin.

Note excellent natural lighting, ventilation and sanitation characteristics.

Simple, functional lines create essentially pleasing exterior.

# LOOKING FOR A WAY TO BUILD BETTER FOOD PROCESSING FACILITIES?

It is just the nature of the food processing industry that physical plant investment be kept to a minimum. Competition is keen. Margins are low—low even in the midst of a veritable revolution in processing, packaging and distribution. Construction expenses that would be considered normal in other industries are often sheer luxuries in food processing facilities.

That's why Butler pre-engineered buildings are so obviously *right* for food processing plant and storage construction. Your initial investment in planning and engineering time is minimized. Butler buildings are half finished before you sign the order—ready for occupancy weeks to months sooner than traditionally-built structures. The finished plant outperforms buildings costing much more. Post-free spans up to 120 feet provide unobstructed interiors for flow planning. Human comfort—better light, ventilation and ease of heating are characteristics pre-engineered into Butler buildings.

You can expand or change a Butler plant with much less time and money, practically no demolition. Doesn't this sound like the building for this industry? It is priced to prove it . . . not the lowest-cost way to get mere shelter, but the lowest-cost suitable construction.

**For further details on Butler buildings—the low-cost way to build better food processing facilities, contact your Butler Builder. He's listed in the Yellow Pages of your telephone directory under "Buildings" or "Steel Buildings." Or write direct.**

BUTLER STEEL PRODUCTS

**BUTLER MANUFACTURING COMPANY**

7504 East 13th Street, Kansas City 26, Missouri

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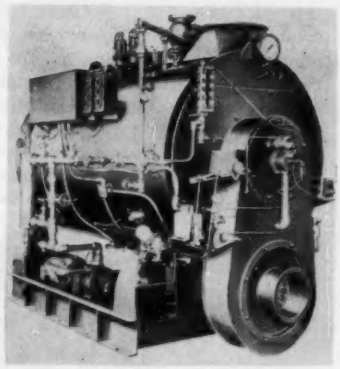

## Package Steam Generator Saves Valuable Space

This compact boiler delivers 5,000 lb. of steam per hr. from an overall floor area of 8x7 ft.

Electronically controlled unit (Marine Steam Generator) is designed to modulate over an extreme range with high efficiency. An oil-pump-set assembly, factory-installed under the 7-ft.-high boiler, saves space and cuts installation cost. Water treatment tanks are mounted on side of boiler shell and piped to feed water pump. By-pass piping permits manually controlled water circulation. — *National-U. S. Radiator Corp., Cyclotherm Div., Oswego, N. Y.* Circle 24, on Reader Service Card

## Television X-Ray System Automates Quality Control

Called a major advance in quality control, this closed-circuit television X-ray system permits continuous product inspection on a TV-like screen—with images 10,000 times brighter than those obtained by conventional fluoroscopy.

A typical application is inspecting conveyed material (10 fpm.) for foreign matter by density or thickness changes.

Designated TVX, system consists of an X-ray sensitive camera, control unit, and viewing monitor. Latter


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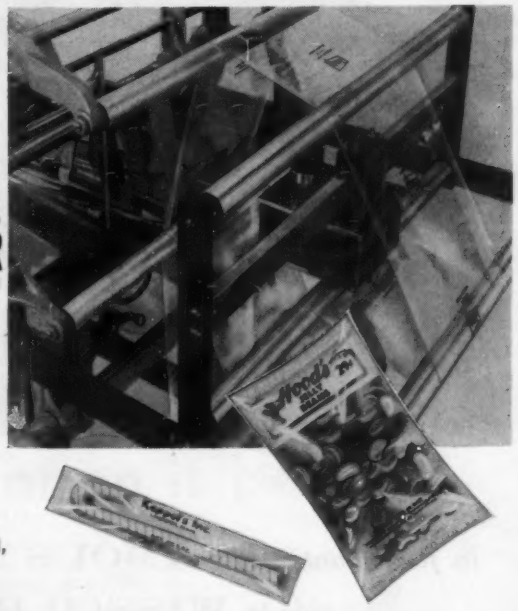

- Occupies less than 1 cubic foot!
- Fully enclosed for instant-drying action!

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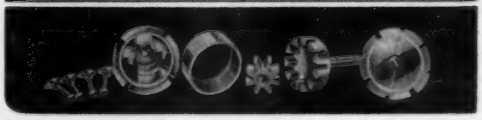

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*in food plants...* "FAMOUS NAME" *products ride on* WISSCO BELTS

Many prominent food companies solve costly, difficult processing problems by using Wissco Belts.

**Kraft Foods Ltd.**, of Montreal, installed a Wissco Stainless Steel Belt and eliminated the loss (due to rust and corrosion) of two new belts each year. The Wissco Belt fulfilled their requirements for cleanliness, corrosion-resistance and long life.

**Beech-Nut Life Savers, Inc.**, also uses Wissco Stainless Steel belting. The open mesh construction has ensured efficient cooling operations, and eliminated flavour-transference problems in their candy processing. Beech-Nut reports: "Absolutely no downtime due to belt repair or replacement, in 30 years of using Wissco Belts."

Yes, Wissco Stainless Steel Belts ensure cleanliness and long life, in food processing operations. Wissco's thin flat spiral construction reduces the major causes of belt trouble . . . stretch, distortion, and breakup. There is no excess wire to bend or stretch. Wissco's open mesh construction permits efficient circulation of air, ensures liquid runoff, assists heating and cooling effectiveness.

Wissco also provides belting in galvanized, carbon and alloy steels for specific applications.

For further details on Wissco Belts and their uses in food-processing applications, send us the coupon below . . . without obligation, of course.

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may be up to 1,400 ft. away from camera, and easily viewed in normally lighted areas. Image size is electronically variable from ½-3 times that of original subject. In addition, images may be recorded on tape.—*General Electric Co., X-Ray Dept., 4855 W. Electric Ave., Milwaukee.*

Circle 25 on Reader Service Card

## Unit Makes Enlargements Of Microfilm Records

Positive enlargements of microfilm records may now be economically made with the use of this compact reproduction machine.

Called Copytron Model 1000, it enlarges 35-mm microfilm, 14 to 16 times, and prints black-on-white enlargements on sheets ranging 8½ x 11 in. to 18 x 24 in. Enlarging and printing are done continuously, and finished prints are delivered at about 4 per min. Latter are termed permanent as a printed page, and can be written on, drawn on, and typed on.

Unit accommodates reel, strip, or card-mounted microfilm, and incorporates a mangnifier scanner that permits the operator to view the microfilm image before print is made.—*Charles Brunning Co., Mt. Prospect, Ill.*

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## Miniature Mercury Switch Has Many Applications

Sensitive, trouble-free operation is offered by this capsule-size mercury switch.

Weighing only 1.8 gm. with leads



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**CREAM OF SPICE SOLUBLE SEASONING • GROUND SPICE**
**PEACOCK BRAND CERTIFIED FOOD COLOR**

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attached, unit (AS419A1) is designed for use in scales, computers, and other devices where minimum operating energy is available and space is limited. It may be mounted in any position around its longitudinal axis, and actuated by slow, snap, or fast-tilting action.

Contact arrangement is single-pole, single-throw. Rating for a resistive load of 1 amp. is 30v. a.c. or d.c.; for 0.5 amp., 110v. a.c.; for 0.75 amp., 110v. d.c. On inductive loads, it is rated at 0.75 amp., 30v. a.c. or d.c. with inrush at 2½ times full load. — *Minneapolis-Honeywell Regulator Co., Micro-Switch Div., Freeport, Ill.*

Circle 27 on Reader Service Card

# INGREDIENTS

## Versatile Polymer Seen Boosting Food Quality

Superior thickening, suspending, and emulsifying properties of a new water-soluble carboxy-vinyl polymer offer wide application in foods.

Known as Carbopol, it has been accepted for use in drugs taken internally, thus early FDA approval for food use is virutally certain. Product is a white fluffy powder, has unusual uniformity, and is compatible with almost any material containing water.

Versatility of this polymer is attested by its ability to suspend golf balls in water, by converting water and alcoholic beverages into thick gels, and by efficiently emulsifying oils and water.

Potential food applications: Improving stability, texture, and taste acceptance of beer, cheese spreads, salad dressings, ice cream and sherberts, jams, jellies, gravies, sauces, and soups.—*B. F. Goodrich Chemical Co., 800 Second Ave., New York City.*

Circle 28 on Reader Service Card

## New Pre-Cooked Starches Cut Processing Costs

Seen economizing production and boosting quality of 'convenience' foods is a new line of cold-swelling starches.

Products (Redijels) are highly soluble in cold liquids such as milk, juices, or water. Thus, they save preparation time, labor, and heating costs.

Typical applications: Instant puddings, dehydrated soups and bakery mixes, confections, ground meat and fish products, instant sauces and gravies, salad and mayonnaise-type dressings, milk-beverage stabilizers, and baby foods.—*Morningstar-Paisley, Inc., 630 W. 51st St., New York City.*

Circle 29 on Reader Service Card

## New Pickle Flavors Give Added Convenience

Blends of quality essential oils in a neutral solvent, a new line pickle flavors may be incorporated directly into the brine.

Designated Pik-O-Spice, they are soluble in any aqueous medium and 12 oz. flavors 100 gal. of brine. In addition, combinations of straight oils and gum are available with directions for making emulsions if desired.—*Dodge & Olcott, Inc., 180 Varick St., New York City.*

Circle 30 on Reader Service Card

## Offers Starch Pre-Tinted With Approved Colors

Originally developed for use in pharmaceutical tablets and powders, this pre-tinted starch is attracting attention of food processors.

Called COLOR-x, it may be used in baked goods, for dusting colored marshmallows and confections, and for certain glazed fruits. Product is a high-grade food starch tinted with approved food colors.—*A. E. Staley Mfg. Co., Decatur, Ill.*

Circle 31 on Reader Service Card

# CHEMICALS

## General-Purpose Absorbent Keeps Floors Clean, Dry

Floors in processing areas may be kept dry, clean, and safe with use of a new mineral absorbent.

Known as Sol-Speedi-Dry, it thoroughly absorbs oils, greases, and liquids—and their odors—without becoming wet itself. Particularly recommended for restoring wood and concrete floors, this granular product is dustless and inert, and may be removed simply by sweeping.

Absorbent is packed in 50-lb. bags. —*Minerals & Chemicals Corp. of America, Menlo Park, N. J.*

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## Synthetic Chain Lubricant Offers Many Advantages

A tacky, semi-fluid grease, this chain lubricant maintains a gel structure for greater retention. It leaves no residue, dissolves most deposits already formed on chain, and provides highly effective lubrication for 6-12 months.

Product (Anderol L-732) is applied in a thin stream on only one side or top of entire chain. When latter is run, lubricant is distributed throughout as a thin film that also precents rust. Material is available in 14-oz. cartridges and 35-lb. pails. —*Lehigh Chemical Co., Industrial Lubricant Div., Chestertown, Md.*

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# BRIEFS

**New Piggy-Back Trailers** and multi-purpose containers will standardize freight shipments on General American's Clejan rail cars. Advanced system integrates rail, truck, and ship transportation for greater speed, economy, and service. — *Fruehauf Trailer Co., 10941 Harper Ave., Detroit.* (34)

**Prepared Cinnamon Mix,** for all types of cinnamon sweetgoods, offers easy preparation of a moist filling. With addition of warm water, product (Cinnaquik) is ready for application by spatula or pump after 5 min. It is available in 100-lb. moisture-proof bags. — *Knickerbocker Mills Co., 601 W. 26th St., New York City.* (35)

**Heavy-Duty Sanitary Hose** has cotton braids reinforced with steel wire. Unit (Flexsteel Sanitary) is tan colored and resistant to fats, oils, weather-aging, and abrasion. It is available in 25- and 50-ft. lengths (½-1½ in. i.d.), pressure to 100 psi. —*Goodyear Tire & Rubber Co., Akron, Ohio.* (36)

**Sanitary Dicer** handles salad items, such as egg and potato, at 5,000 lb. per hr. Cutting knives, cylinders, and attachments are of stainless steel. Interchangeable dicing heads give ½-, ⅜-, or ¾-in. pieces.—*R. Howard Strasbaugh, 10990 Santa Fe Ave., Lynwood, Calif.* (37)

**Self-Lubricated Roller Chain** has pre-impregnated sintered steel bushings that release lubricant during operation for life of chain. Unit eliminates product contamination, and is termed ideal for hard-to-maintain locations.—*Whitney Chain Co., Hamilton St., Hartford, Conn.* (38)

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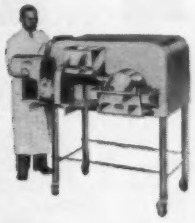

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Enclosure provides safety from rotating parts. CogMills may be used as single units or as components in a continuous operation with one or more mills and associated apparatus.

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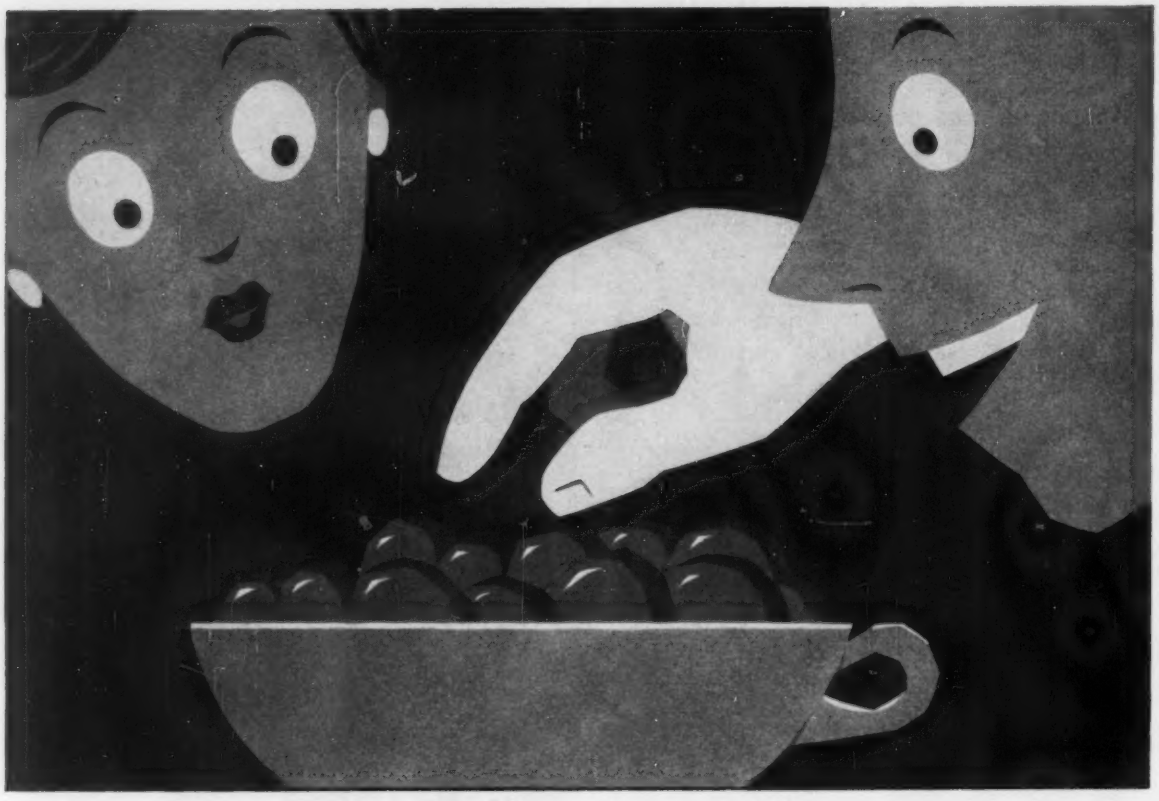

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# USEFUL NEW BOOKS

## Taste is the Gage

FLAVOR RESEARCH AND FOOD ACCEPTANCE. *Sponsored by Arthur D. Little, Inc. Published by Reinhold Publishing Corp., 430 Park Ave., New York City 22, 1958. 391 pages. Price:* $10.

Based on a series of symposiums held by Arthur D. Little, Inc., this valuable reference book discusses important recent discoveries made by research centers in sensory testing, consumer testing, psychology, physiology, and chemistry. Flavor is acknowledged as one of the basic factors of food product success and here for the food management man is the latest on what physiologists and psychologists have found out about the basis and importance of taste and smell; what chemists know of the chemical aspects of flavor; what market research knows of consumer wants; and what methods are used in sensory flavor analysis.

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## How to Sell Abroad

THE EUROPEAN COMMON MARKET. *Published by the American Management Association, 1515 Broadway, New York City 36. 1958. 256 p. Price:* $6. *(AMA Members:* $4).

This interesting book examines all the implications of the European common market from the standpoint of American business. A clear and authoritative survey, it reveals how the European common market was conceived and planned, what trends and attitudes in the ECM countries may influence the American manufacturer, and how ECM itself will affect many aspects of U.S. business, particularly its marketing and manufacturing policies.

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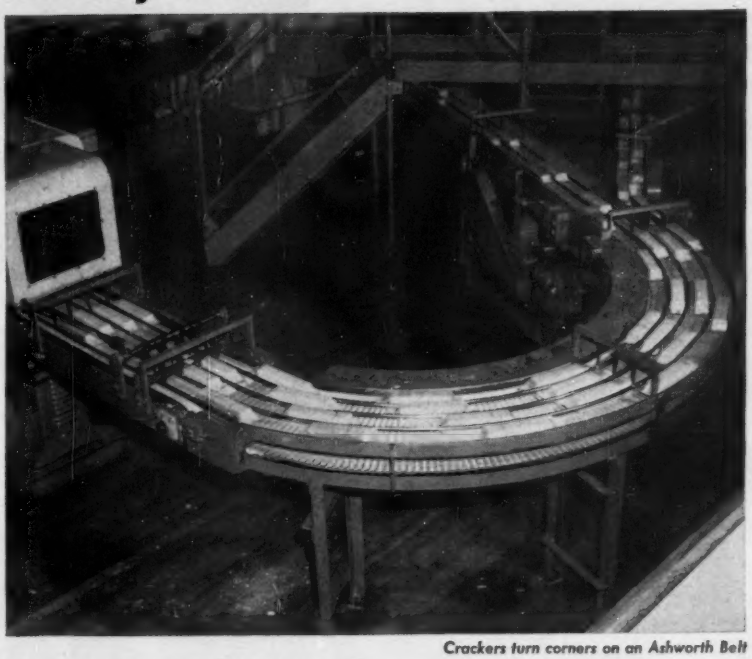

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Of Food Engineering, published monthly at Albany, New York for October 1, 1958.

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**Dried Milk** Having Porous Aggregates Permitting Instant Reconstitution—Instant Milk Co., Los Angeles. No. 2,835,586.

**Dried Pie Products** Containing Upper and Lower Crusts, Rehydratable Filling — Pillsbury Mills, Inc., Minneapolis. No. 2,836,498.

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**Gelatin Dessert** Containing Degraded Gelatin of Regular Bloom—General Foods Corp., N.Y.C. No. 2,838,402.

## PROCESSING

**Improving** Meat Color by Contracting With Ferrous Salts—Armour & Co., Chicago. No. 2,831,774.

**Separating** Oil From Herring by Heating, Pressing, Evaporating With Intermediate Centrifuging—S. Sirnes, Haugesund, Norway. No. 2,832,684.

**Solubilizing** Milk Protein by Successive Treatments With Non-Volatile and Volatile Alkali, Heating, Spray Drying—Crest Foods Co., Ashton, Ill. No. 2,832,685.

**Reducing** Fruit-Juice Color by Reacting With Anthocyanase Enzyme, Separating—Rohm & Haas Co., Philadelphia. No. 2,832,688.

**Irradiating** Meat by Adding Free-Radical Acceptor, Subjecting to High-Energy Ionizing Radiation — Research Corp., N.Y.C. No. 2,832,689.

**Vacuum-Cooling** of Leafy Vegetables—Western Vegetable Industries, Inc., Salinas, Calif. No. 2,832,690.

**Extracting** Comminuted Unroasted Coffee, Separating From Grounds — American Home Products Corp., N.Y.C. No. 2,833,653.

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**Spray-Drying** Milk by Forming Divergent Mist, Applying Concentric Annular Heated Air Streams (Hottest Air Contacting Densest Mist), Collecting Dry Powder—M. E. Barzelay, Syracuse, N.Y. No. 2,835,597.

**Cooking** Potato Chips by Continuously Delivering Hot Oil to Inlets at Cooking Zone, Advancing Chips Through Oil—A. Salvo, Fall River, Mass. No. 2,836,496.

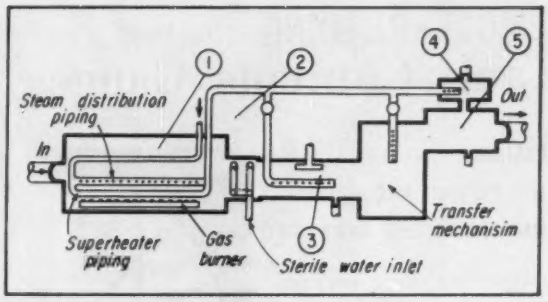
**Treating** Grape Material With Pectin-Hydrolyzing Agent and Finely Divided Wood-Pulp Fiber Prior to Pressing—S. K. Wolcott, Jr., Penn Yan, N.Y. No. 2,837,431.

## EQUIPMENT

**Meat Former** Consisting of Compression Chamber, Feed Conduit, Discharge Orifice—A. M. DePascale, E. Orange, N. J. No. 2,822,570.

**Tomato Treating** and Coring Machines—Hershel California Fruit Products Co., San Jose. Nos. 2,822,842, 843.

**Automatic Candler** for Brown, White Eggs — G. N. Bliss, Ithaca, N.Y. No. 2,823,800.

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**Doughnut Machine** Having Imperforate Drop Plate Below Fat Level in Tank—Petersen Oven Co., Franklin Park, Ill. No. 2,826,983.

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**Fruit Orienting, Marking Machine**—J. H. Tarlton, Inglewood, Calif. No. 2,830,531.

**Raisin Washer** Comprising Tank, Water Inlet, Auger, Product-Discharge Pipe—E. J. Vagim, Fresno, Calif. No. 2,-830,603.

**Flexible Screw Conveyor** Employing Tube, Short Auger Section, Axial Drive Shafts—M. H. Fennimore & I. J. Stephenson, La Crosse, Wash. No. 2,830,-695.

**Tomato Skinning, Coring Units** —H. B. Rollins, Baltimore. Nos. 2,831,516, 518.

**Halved-Fruit Turnover Device** —G. Lauer, Oakland, Calif. Nos. 2,832,459, 460.

**Photoelectric Unit** for Separating Eggs According to Shell Color—K. H. Norris and A. W. Brant, Beltsville, Md. No. 2,833,408.

**Sausage Linker** Consisting of Casing-Directing Guard Members, Opposed Endless Conveyors, Spaced Dividers — L. P. Cross, Valparaiso, Ind. No. 2,834,042.

**Case Loader** (Beaded Milk Bottles) Employing Single-File Conveyor, Pusher Plate for Successive Rows of Four Bottles, Descending Carrier—W. B. Loveridge, Prospect, Conn. No. 2,834,167.

**Vegetable Coring Unit** Having Vertical Shaft With Rotary Head, Downwardly Movable Product Holder—Consolidated Foods Corp., Gentry Div. No. 2,835,294.

**Juice Concentrator** Comprising Three Upright Coaxial Heat-Exchange Surfaces, Radial Type Blades, Liquid-Distribution Means, also Product-Collecting Troughs—M. M. Koffler, Tel Aviv, Israel. No. 2,836,235.

**Continuous Diffuser** for Sugar-Bearing Materials—J. P. Ruth, Denver. No. 2,836,519.

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**Sauerkraut-Processing Unit** Employing Tank, Baffle Plate, Perforated Member, Liquid-Recirculating Means—McBean Research Corp., Rochester, N. Y. No. 2,837,319.

## PACKAGING

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**Coating Foods** With Transparent Plastic Applied as Hot Melt — Dow Chemical Co., Midland, Mich. Nos. 2,840,474, 475, 476.

**Air-Tight Plastic Casing** for Compressed Hops Bale — Tri-State Processing Co., Yakima, Wash. No. 2,841,500.

**Packaging Unit** for Filling and Staple-Closing Preformed Paper Cartons Having Gabled Tops—A. B. Mojonnier, Chicago. No. 2,841,936.

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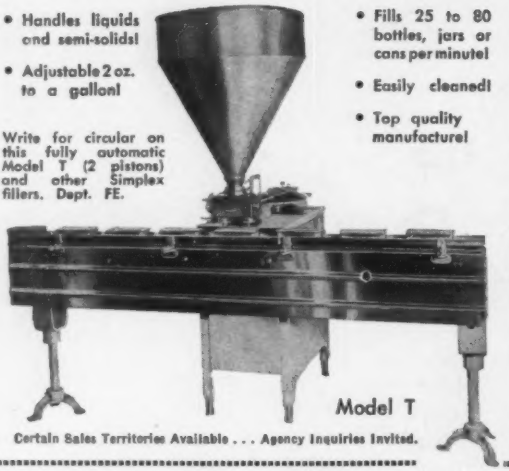

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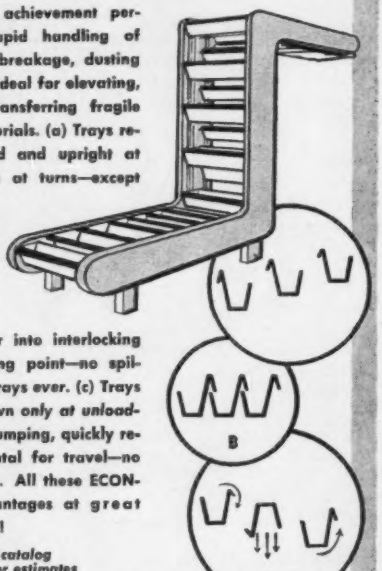


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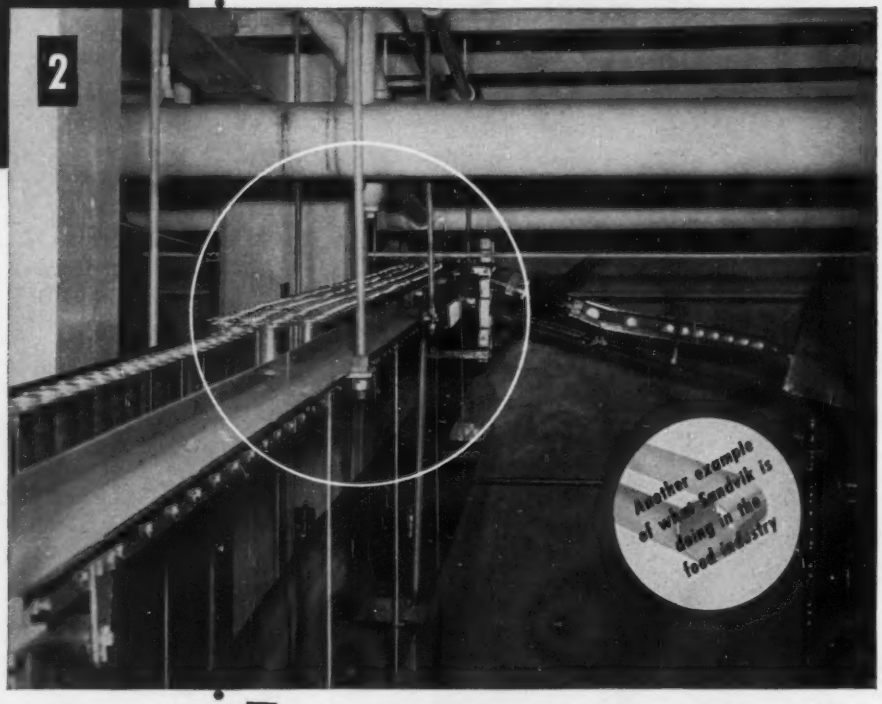


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## ADVERTISERS IN THIS ISSUE


Algin Corp. of America ..... 144
Allegheny Ludlum Steel Corp. ..... 122
American Can Co. ..... Second Cover
Angelus Sanitary Can Machine Co. ..... 72
Ashworth Bros., Inc. ..... 147

Bausch & Lomb Optical Co. ..... 4
Blaw-Knox Co.
Buflovak Equipment Div. ..... 10-11
Dairy Equipment Div. ..... 143
Buffalo Weaving & Belting Co., Inc. ..... 108
Burt Co., F. L. ..... BL150
Butler Manufacturing Co. ..... 138

Cambridge Wire Cloth Co., The ..... 33
COG Corp.
Div. of Motiograph, Inc. ..... 145
Continental Can Co.
Fibre Drum and Corrugated Box Div. ..... 94-95
Gair Boxboard & Folding Carton Div. ..... 9
Crown Cork & Seal Co., Inc. ..... 89
Crown Zellerbach Corp.
Gaylord Container Corp. ..... 148
Crucible Steel Company of America
Trent Tube Co. ..... 137
Cyclone Fence Dept., Amer. Steel & Wire Div., United States Steel ..... BL118

Day Co., The J. H. ..... 30
Dodge & Olcott Inc. ..... 31
Dodge Manufacturing Corp. ..... 18
Dow Corning Corp. ..... 91
Dustex Corp. ..... TL118

Econ-O-Veyor ..... BR150
Emery Co., The A. H. ..... 134
Exact Weight Scale Co., The ..... 88

Ferguson Co., J. L. ..... 82
Firmenich Inc. ..... 19
Food Machinery & Chemical Corp.
Canning Machinery Div. ..... 6
FMC Packaging Machinery Div.
Stokes & Smith Plant ..... 34
Foxboro Company, The ..... 106
Frick Co. ..... 71
Fritzsche Brothers, Inc. ..... 146

Gardner-Denver Co. ..... 84-85
General Mills, Inc.
Special Commodities Div. ..... 93
Globe Woven Belting Co., Inc. ..... 101
Goodrich Industrial Products Co., B. F. ..... 12
Gottscho, Inc., Adolph ..... TR139
Griffith Laboratories, Inc., The ..... 103

Hayssen Manufacturing Co. ..... 14
Hertz System, Inc. ..... 73-74
Hope Machine Co. ..... BL158
Howe Scale Co. The ..... 117

Industrial Nucleonics Corp. ..... 115
International Salt Co., Inc. ..... 157

Jamison Cold Storage Door Co. ..... 112
Jenkins Bros. ..... 60
Johns-Manville
Celite Filter Aids ..... 70
Jones & Laughlin Steel Corp.
Stainless & Strip Div. ..... 22

Kelco Co. ..... 136
King Co. of Owatonna, The ..... 127
Klenzade Products, Inc. ..... 68

Ladish Co.
Tri-Clover Div. ..... 132
La Porte Mat Mfg. Co. ..... 135
Liquidometer Corp. ..... TL150

Mack Trucks, Inc. ..... 56
Manton-Gaulin Mfg. Co., Inc. ..... 54
Master Mechanics Co., The ..... 57
Merck & Co., Inc. ..... 36, 151
Monarch Mfg. Works, Inc. ..... 59

Nash Engineering Co. ..... 121
National Starch Products, Inc. ..... 80
Norda, Inc. ..... Third Cover

Olin Mathieson Chemical Corp.
Forest Products Div. ..... 107
Olin Film Div. ..... 37-40

Package Machinery Co. ..... 126
Paterson Parchment Paper Co. ..... 5
Patterson-Kelley Co., Inc., The ..... 16-17
Pfaudler Co., The
Div. of Pfaudler Permutit, Inc. ..... 102
Pfizer & Co., Inc., Chas. ..... 110-111
Pittsburgh Corning Corp. ..... 120
Pneumatic Scale Corp., Ltd. ..... 130
Polak & Schwarz, Inc. ..... 124
Powell Valves ..... 128

Reliance Electric & Engineering Co.
Reeves Pulley Co., Div. ..... 23
Riegel Paper Corp. ..... 27
Robbins & Myers, Inc. ..... 32
Ryerson & Son, Inc., Joseph T. ..... 100

Sandvik Steel, Inc. ..... 152
Sarco, Inc. ..... 20
Schutte & Koerting Co. ..... 90
Shulton Inc. ..... 15
Sprout, Waldron & Co., Inc. ..... 125
Standard Metal Products Co. ..... 92
Stange Co., Wm. J. ..... 141
Stephens-Adamson Mfg. Co. 48-49, 69, 123
Sterwin Chemicals, Inc. ..... 129
Sunkist Growers ..... 58

Taylor Instrument Cos. ..... 28-29
Tri-Homo Sales Corp. ..... TL158

Union Bag-Camp Paper Corp. ..... 62-63
United States Gasket Co.
Plastics Div. of the Garlock Packing Co. ..... 114
United States Rubber Co.
Mechanical Goods Div. ..... 86
U. S. Stoneware Co., The ..... 119

Van Ameringen-Haebler, Inc. ..... Back Cover
Viking Pump Co. ..... BR139
Vilter Mfg. Co., The ..... 8

Wallace & Tiernan, Inc. ..... 46
Wear-Ever Aluminum, Inc. ..... 75
Western Condensing Co. ..... 116
Wickwire Spencer Steel Div. of The Colorado Fuel & Iron Corp. ..... 140

Yarnall-Waring Co. ..... 26


• • •

### CLASSIFIED ADVERTISING

F. J. Eberle, Business Mgr.


PROFESSIONAL SERVICES ..... 156
EMPLOYMENT OPPORTUNITIES ... 153
EQUIPMENT (Used or Surplus New) For Sale ..... 154-155



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"We've been using Sterling Purified Canners Salt for years on our lines, because we like the way canned vegetables always retain their rich natural colors."

"We've licked the problem of oxidative rancidity in vegetable fats and oils caused by impurities in ordinary salt. We use only Sterling Purified Salt."

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These are typical of the comments food processors have for the quality of Sterling Purified Salt.

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2. It has a constant volume for any given weight—can be measured with precision on either a weight or a volume basis.
3. It dissolves instantly and *uniformly*—in every type of salting operation.

You can use Sterling Purified Salt dry, or in brine form, with equal effectiveness. Many of today's food processors, however, find brine most convenient and economical, because it greatly simplifies salt handling and reduces salt consumption. To make high-quality brine automatically from Sterling Purified Salt, International has developed the Sterling Evaporated Salt Dissolver in many custom designs and sizes . . . in steel, Monel metal, or corrosion-proof plastic.

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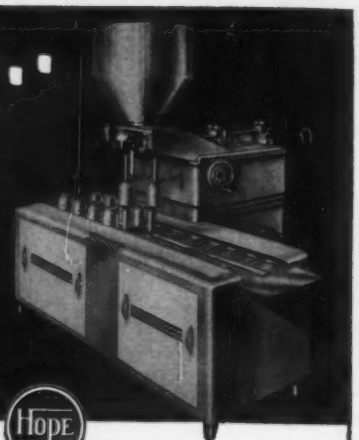

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## ADVERTISERS' LITERATURE

Offered in ads received up to 10th of last month. For copies circle key numbers on card at right.

**Transport**

**Truck leasing.** Booklet, Hertz Truck Lease Service. —156

**Materials Handling**

**Rubber belt.** 14 p. booklet, Buffalo Weaving & Belting Co.—157

**Conveying systems.** Bulletins, Stephens-Adamson.—158

**Metal conveyor belt.** Book, American Steel & Wire (U.S. Steel).—159

**Flexible-steel conveyor belting.** Illustrated literature, La Porte Mat & Mfg. Co.—160

**Stainless steel belt.** Folder, Wissco Belts (F.&I.).—161

**Metal process belt.** Illustrated literature, Ashworth Bros.—162

**Elevator-conveyor.** Catalog on Econ-o-lift, Econ-O-Veyor.—163

**Wire mesh belts.** 130 p. Reference manual, Cambridge Wire Cloth Co.—164

**Air hoist.** Bul. 86-1, Gardner-Denver.—165

**Aluminum** bins, boxes, drums, trucks. Catalog, Wear-Ever Aluminum.—166

**Glassed-steel storage tank.** Bulletin, Pfaudler Co.—167

**Processing Equipment**

**Aluminum kettles,** utility items. Catalog, Wear-Ever Aluminum.—168

**Saw-tooth crusher.** Advance Spec. Sheet 204, Sprout-Waldron.—169

**Stream splitter.** Bul. 137-5, Sprout-Waldron.—170

**Cooker & cooler.** Brochure, "The Sterilmatic Story", Food Machinery & Chemical Corp.—171

**Concentrator.** Roto-vak, Bul. 383, Blaw-Knox Co.—172

**Mixer-blender.** Bul. 800, J. H. Day Co.—173

**Homogenizer & colloid mill.** Respectively, GTA Bu. H55 & GTA Bul. C57, Manton-Gaulin.—174

**Filter.** Bul. 911, Pfaudler Co.—175

**Heat exchanger.** Bul., Pfaudler Co.—176

**Centrifuge.** Bul., Pfaudler Co.—177

**Dryer.** Bul., Pfaudler Co.—178

**Evaporator,** wiped film. Bul., Pfaudler Co.—179

**Dust collector.** Folder on Microcone, Dustex Corp.—180

**Food slice separator.** Bul. 657, Stephens-Adamson. —181

**Pumps**

**Progressive-cavity pump.** Bul. 30-FE, Moyno, Robbins & Meyers.—182

**Rotary pump.** Cat. Sec. FE on Sanitor, Viking Pump Co. —183

**Valves, Tubing, Nozzles, Traps,**

**Sanitary tubing.** Bul. T-97, Tygon, U.S. Stoneware.—185

**Metal tubing.** Tubing handbook, Trent Tube Co.—186

**Steam trap.** Literature Kit 2A, Sarco Co.—187

**Spray nozzle.** Cat. 1, Monarch Mfg. Works.—188

**Sanitary fittings.** Cat. 1-159, Tri-Clamps, Ladish Co.—189

# CIRCLE NUMBERS ON CARD

*Advertisers' Literature (Cont'd)*

**Power, Motors, Transmissions**

**Sprockets,** roller chain. Bul. A-644, Taper-Lock, Dodge Mfg. Corp.—190

**Sanitary motor drive.** Bul. M588, Reliance Electric & Engineering Co.—191

**Refrigeration**

**Refrigeration.** Case study, Vilter Mfg. Co.—192

**Controls & Instruments**

**Steam temperature control.** Bul. 6-D, Desuperheater, Schutte & Koerting.—193

**Instrumentation.** Application Engineering Data, Foxboro Co.—194

**Tank weighing system.** Bul. 582, Way-Pac, A. H. Emery Co.—195

**Color analyzer.** Folder D 1-290, Bausch & Lomb.—196

**Temperature controls.** Cat. 500-MP, Taylor Instrument Cos.—197

**Continuous weigher.** Bul. 958, Stephens-Adamson. —198

**Scale feeder,** Booklet M-33, Merchen, Wallace & Tiernan, Inc.—199

**Under-over scale.** Form 3333, Shadograph, Exact Weight Scale Co.—200

**Batching system.** Booklet, Batchmaster, Howe Scale Co.—201

**Ingredient, Chemicals**

**Whey.** Bulletins on Valley Fresh products, Western Cond. Co.—202

**Flavors. Book,** "The Changing World of Food", Ref. book & catalog of flavors & seasonings, Dodge & Olcott. —203

**Packaging Machinery**

**Printing unit.** Bul. RIN-7 on Rolaprinter, Gottscho.—204

**Filter.** Circular on Simplex unit, F. L. Burt Co.—205

**Filler rotary piston.** Bul., Pfaudler Co.—206

**Packaging Materials**

**Corrugated box.** Booklet on manufacture of corrugated boxes, Union Bag-Camp Paper Corp.—207

**Construction, Maintenance**

**Glass insulation.** Literature on Foamglas, Pittsburg Corning.—208

**Teflon.** Bul. AD-158, Teflon, U.S. Gasket Co.—209

**Stainless sheet & strip.** Manual, Jones & Laughlin Steel Corp.—210

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# Equipment & Supplies in This Issue

Circle key numbers on card below


### Construction, Maintenance

Battery Cells.....19
Buildings .....332
Cementable Teflons.309
Cold Storage Doors.308
Gear Drive Maintenance ...111
Impervious Wall & Floor Finish...112
Insulation Foamglas .....316
Sanitary Hoses.....36
Sanitile .....276
Self-Lubricated Roller Chains....38
Stainless Steel ....300, 318
Water Softeners....74

### Control & Instruments

Automatic Controls.264
Batchmasters ....312
Color Analyzers...247
Electrical Devices.113
Fill Control Systems .....310
Fill Monitors.....17
Flow Rate Indicators .....68
Formula Changeover Systems .....69
Fume Hoods.....118
Gage Protectors....70
Hydraulic Tank Weighing Systems .....328
Instrumentations ....304, 305
Liquidometers ...343
Manometers .....117
Mercury Switches...27
Plastic Door Instruments ....66
Prefilters .....67
Pressure Switches..22
Pneumatic Temperature Controllers...72
Punched Tape Data System...124
Scales .....293
Scales, Bulk.....96
Scale Feeders.....272
Stainless Thermometers ...73
Steam Temperature Controls...295
Thermocouple Assemblies .....71
TV X-Ray Systems .....25
Water Gages.....76
Weighers, Continuous ....282

### Ingredients, Chemicals

Absorbents .....32
Algins .....330
Antioxidants .....303
Cinnamon Premix...35
Citrus Fruits.....277
Colors .....325
Defoamers .....296
Extracts .....338
Flavors ....123, 266
320, 340, 351, 352
Flavors, Pickle.....50
Flavors, Pickle Spice .....121
Food Fortifiers....298
MSG .....270
Polymer Thickener .....28
Pre-cooked Starches .....29
Pre-tinted Starches .....31
Proteins .....303
Starches .....288
Starch Fractions..122
Seasonings .....303
Tenderizers .....303
Vanillin ....255, 325
Vitamins ...325, 346

### Lubrication

Chain Lubricants .....33

### Management

Buyers' Guide....126
Closed Circuit TV.125
Microfilm Enlarger..26
Special Purpose Stainless Steel..128
Tax Guide.....127

### Materials Handling

Air Hoist.....291
Belting.301, 306, 329
Bins, Aluminum...287
Boxes, Aluminum..287
Conveyor Belts.....268, 314 335, 341
Conveyors, Elevators .....273
Drums, Aluminum.287
Elevators .....345
Flexible Suction Hoses .....253
Handling & Storage Systems.105
Steel Belt Conveyors .....347
Steel Dock Plates.103
Tub Trucks .....104
Trucks, Aluminum.287
Vacuum Handling Attachments ....21
Vibrating Conveyors .....106

### Packaging Machinery

Automatic Fillers..344
Can Closers.....285
Fillers .....326
Fillers, Diagonal..350
Formers .....326
Imprinters .....333
Indexing Machines.102
Package Makers...100
Rotary Piston Fillers .....302
Scale Feeders.....254
Sealers ....269, 326
Wrappers .....269

### Packaging Materials

Boxes, Corrugated.280
Cellophane .....271
Labels, Foil.....1
Laminated Wrappers .....263
Log Caps.....294
Meat Wrappers....101
Protective Wrappers .....248
Plastic Caps.....3
Plastic Carriers.....2
Pressure Cans....246
Shaker Canisters.101

### Pipes, Valves, Traps

Pipe Joints.....78
Spray Nozzles....278
Steam Traps.77, 259, 262
Tubing, Metal....331
Tubing, Plastic...315
Valves .....324

### Power Generators, Motors, Transmissions

Couplings ...257, 258
Motors .....87
Motors, Vertical...89
Reduction Drives...86
Sanitary Motor-drives ....260, 261
Sprockets ..257, 258
Steam Generator...24
Water Tube Boilers.88

### Processing Equipment

Blenders ....256, 339
Can Coolers.....18
Centrifugal Separators .....252
Continuous Reactors .....97
Drum Dryers.....98
Dryers .....337
Electric Precipitators ...79
Evaporators ..92, 337
Food Slice Separators ....319
Filter Aids.....283
Glass Lined Reactors .....96
Grinders .....339
Choppers .....339
Homogenizers.274, 349
Instantizers .....337
Kettles, Aluminum .....287
Lab Stirrers.....116
Microclone Dust Collectors .....313
Mixers .....265
Pasteurizer Coolers .....297
Pneumatic Stunners.20
Pressure Cookers..249
Sanitary Dicers....37
Single Disk Aspirators .....93
Size Reduction Equipment ....321
Steam Tube Dryers .....94
Tank Handling of Shortening....91
Utility Ovens.....119
Wire Belts.....99

### Pumps & Air Compressors

Air Compressors...290
Barometric Condensers .....75
Pumps.....267, 334

### Refrigeration

Centrifugal Refrigeration ...90
Compressors..250, 284
Freeze Units.....323
Refrigeration Units, Truck...114

### Sanitation & Cleaning

Detergents .....281
Hoses .....292
Jet Cleaners.....108
Polyethylene Duct Systems...110
Sludge Bed Cleaners .....107
Spray Cleaner & Degreaser .....109

### Transport

Fork Trucks .....23
Piggyback Trailers..34
Pneumatic Trailers.115
Trucks .....16

### Workers' Supplies

Respirator & aluminized asbestos clothing..120


## NOVEMBER, 1958

Expires January, 1959

CIRCLE KEY NUMBERS BELOW, FILL IN REVERSE SIDE, MAIL

| NEW PACKAGES AND PRODUCTS | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | | | | |
| EQUIPMENT | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | |
| 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | |
| 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | | | | | | | | | | | |
| JUST OFF PRESS | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | |
| 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | |
| 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | |
| 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | |
| 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | | | | | | | | | | | | | |
| ADVERTISERS' LITERATURE | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | | | |
| 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | |
| 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | |
| 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | |
| 235 | 236 | 237 | 238 | 239 | 240 | 241 | 242 | 243 | 244 | 245 | | | | | | | | | | | |
| ADVERTISEMENTS | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | 257 | 258 | 259 | 260 | 261 | 262 | | |
| 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 | 271 | 272 | 273 | 274 | 275 | 276 | 277 | 278 | 279 | 280 | 281 | 282 | 283 | |
| 284 | 285 | 286 | 287 | 288 | 289 | 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 | 298 | 299 | 300 | 301 | 302 | 303 | 304 | |
| 305 | 306 | 307 | 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 | 318 | 319 | 320 | 321 | 322 | 323 | 324 | 325 | |
| 326 | 327 | 328 | 329 | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 339 | 340 | 341 | 342 | 343 | 344 | 345 | 346 | |
| 347 | 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 | 358 | 359 | 360 | 361 | 362 | 363 | 364 | 365 | 366 | 367 | |
| 368 | 369 | 370 | 371 | 372 | 373 | 374 | 375 | 376 | 377 | 378 | 379 | 380 | 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | |
| 389 | 390 | 391 | 392 | 393 | 394 | 395 | 396 | 397 | 398 | 399 | 400 | 401 | 402 | 403 | 404 | 405 | 406 | 407 | 408 | 409 | |
| 410 | 411 | 412 | 413 | 414 | 415 | 416 | 417 | 418 | 419 | 420 | 421 | 422 | 423 | 424 | 425 | 426 | 427 | 428 | 429 | 430 | |
| 431 | 432 | 433 | 434 | 435 | 436 | 437 | 438 | 439 | 440 | | | | | | | | | | | | |

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| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | | | | |
| EQUIPMENT | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | |
| 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | |
| 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | | | | | | | | | | | |
| JUST OFF PRESS | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | |
| 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | |
| 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | |
| 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | |
| 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | | | | | | | | | | | | | |
| ADVERTISERS' LITERATURE | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | | | |
| 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | |
| 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | |
| 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | |
| 235 | 236 | 237 | 238 | 239 | 240 | 241 | 242 | 243 | 244 | 245 | | | | | | | | | | | |
| ADVERTISEMENTS | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | 257 | 258 | 259 | 260 | 261 | 262 | | |
| 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 | 271 | 272 | 273 | 274 | 275 | 276 | 277 | 278 | 279 | 280 | 281 | 282 | 283 | |
| 284 | 285 | 286 | 287 | 288 | 289 | 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 | 298 | 299 | 300 | 301 | 302 | 303 | 304 | |
| 305 | 306 | 307 | 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 | 318 | 319 | 320 | 321 | 322 | 323 | 324 | 325 | |
| 326 | 327 | 328 | 329 | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 339 | 340 | 341 | 342 | 343 | 344 | 345 | 346 | |
| 347 | 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 | 358 | 359 | 360 | 361 | 362 | 363 | 364 | 365 | 366 | 367 | |
| 368 | 369 | 370 | 371 | 372 | 373 | 374 | 375 | 376 | 377 | 378 | 379 | 380 | 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | |
| 389 | 390 | 391 | 392 | 393 | 394 | 395 | 396 | 397 | 398 | 399 | 400 | 401 | 402 | 403 | 404 | 405 | 406 | 407 | 408 | 409 | |
| 410 | 411 | 412 | 413 | 414 | 415 | 416 | 417 | 418 | 419 | 420 | 421 | 422 | 423 | 424 | 425 | 426 | 427 | 428 | 429 | 430 | |
| 431 | 432 | 433 | 434 | 435 | 436 | 437 | 438 | 439 | 440 | | | | | | | | | | | | |

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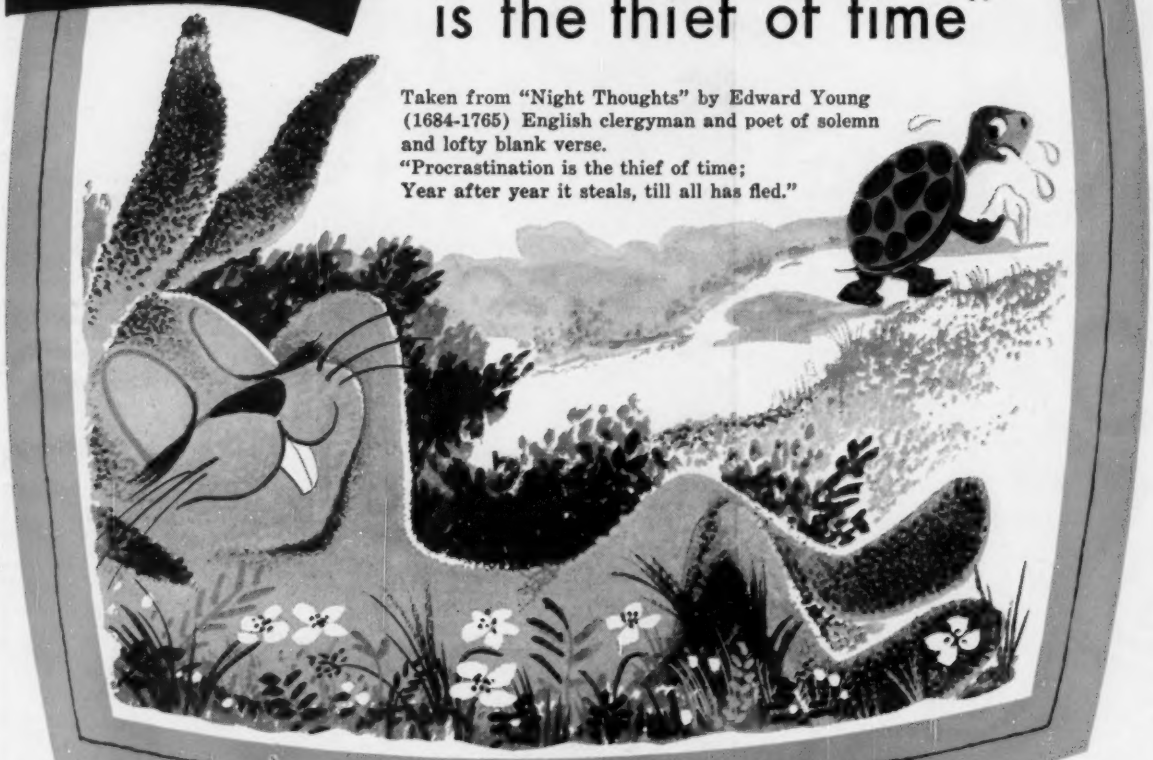

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